

**EPA Superfund
Record of Decision:**

**BEAUNIT CORP. (CIRCULAR KNIT & DYEING PLANT)
EPA ID: SCD000447268
OU 01
FOUNTAIN INN, SC
09/29/1995**

Text:

RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

BEAUNIT CIRCULAR KNIT & DYEING
SUPERFUND SITE

FOUNTAIN INN, GREENVILLE COUNTY
SOUTH CAROLINA

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

SEPTEMBER 29, 1995

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Beaunit Circular Knit & Dyeing
Fountain Inn, Greenville County, South Carolina

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Beaunit Circular Knit & Dyeing Superfund Site (the Site) in Fountain Inn, South Carolina, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. 9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP), 40 C.F.R. Part 300 et seq. This decision is based on the administrative record file for this Site.

The State of South Carolina concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This remedial action addresses on-Site soil contamination.

The major components of the selected remedy include:

- *Containment of soils and sediments contaminated with volatile organic compounds (VOCs) and metals by capping of the lagoon area.

- *Additional monitoring of groundwater and soils on a regular schedule to determine effects of construction of lagoon cap, and to insure effectiveness of cap after construction. Modifications to the frequency or termination of continued monitoring will be determined during the Remedial Action and the Five Year Review.

DECLARATION

The selected soil and groundwater remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technology to the maximum extent practicable for this Site. The selected remedy component satisfies the preference for treatment. The remedy is protective of human health and the environment and meets statutory findings.

Because selection of this remedy will result in contaminated soil remaining on-Site above health-based levels while limiting exposure and mobility, a five year review will be conducted after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Richard D. Green
Associate Director
Office of Superfund & Emergency Response

Date

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirements
BLS	below land surface
CAG	Carcinogen Assessment Group
CDM FPC	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLP	Contract Laboratory Program
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantification Limit
CWA	Clean Water Act
DQO	Data Quality Objectives
EEI	Environmental Exploration, Inc.
EPA	Environmental Protection Agency
ES	Engineering-Science, Inc.
ESD	Environmental Services Division
FCR	Field Change Request
FPDWS	Federal Primary Drinking Water Standards
FS	Feasibility Study
FSDWS	Federal Secondary Drinking Water Standards
FSP	Field Sampling Plan
FWQC	Federal Water Quality Criteria
GC	gas chromatograph
gpd	gallons per day
GPR	ground penetrating radar
hr	hour
HSWA	Hazardous and Solid Waste Amendments of 1984
in	inch
kg	kilogram
L	liter
MCL	Maximum Contaminant Levels
MCLG	Maximum Contaminant Level Goals
MDRD	Minimum Detectable Relative Difference
ug	microgram
mm	millimeters
MS	matrix spike

MSD	matrix spike duplicate
MSL	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 8 March 1990
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
OVA	Organic Vapor Analyzer
PCB	polychlorinated biphenyl
PEL	Permissible Exposure Limit
ppb	parts per billion
PPM	parts per million
PSCS	Preliminary Site Characterization Summary
PVC	polyvinylchloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RPD	Relative Percent Difference
RRF	Relative Response Factor
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SCDHEC	South Carolina Department of Health and Environmental Control
SCS	Soil Conservation Service
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
SOW	Statement of Work
SVOC	Semivolatile Organic Compound
TBC	to be considered
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TLV	Threshold Limit Value
Tot	Total Organic Carbon
TSS	Total Suspended Solids
TWA	Time Weighted Average
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Service
VOC	Volatile Organic Compound

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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Record of Decision for the Beaunit Circular Knit & Dyeing Superfund site in Fountain Inn, South Carolina. This Record of Decision presents the alternatives that the EPA has considered for the surface soil and groundwater contamination found at the Beaunit site.

EPA, in consultation with South Carolina Department of Health and Environmental Control (SCDHEC), selected this final remedy for the site after publication of a Proposed Plan, a Public Meeting, and a Public Comment period of two months. The fact sheet and notice of the Public Meeting were mailed to those on a mailing list developed during initial public participation activities including extensive interviews with local officials and area residents. The Public ConfLuent period was extended from the required one month to two months because of a request from the public. Changes to the preferred alternative contained in the Proposed Plan, or a change from the preferred alternative to another, might have been made if public comments or additional data indicated that such a change would result in a more appropriate solution. The final decision regarding the selected remedy in this Record of Decision (ROD) has taken into consideration all comments from SCDHEC and the public. The selected alternative has not changed from that selected for the Proposed Plan. Several written comments were received from the public. Those comments along with EPA's response is contained in the attached Responsiveness Summary.

EPA is issuing this Record of Decision as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This document summarizes information that can be found in greater detail in the Remedial Investigation/Feasibility Study (RI/FS) Reports and other documents contained in the Administrative Record, located at the Information Repository at the Fountain Inn Public Library located on Main Street in Fountain Inn, South Carolina and at the Superfund Record Center at EPA Region 4 Headquarters located at 345 Courtland Street, Atlanta, GA.

2.0 BEAUNIT NPL SITE LOCATION AND DESCRIPTION

The Beaunit site occupies approximately 1.3 acres on the northwest side of Fountain Inn, South Carolina. Fountain Inn is 15 miles southeast of the City of Greenville. The site is the

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former wastewater lagoon, and its surroundings, that Served a former knitting, dyeing, and finishing plant about 400 yards east

of the site. The wastewater lagoon was built in 1951 and ceased operations in 1977 when the adjacent plant connected to municipal sewage. In 1980 the wastewater treatment structures around the lagoon were demolished and the lagoon partially filled in. The Site is currently inactive and enclosed within a secured fence. The adjacent plant currently is operated by Wilson Sporting Goods for the manufacture of tennis balls.

The site is located off Valley View Road. Land use within one mile of the site includes small farms, residential areas, several businesses, and industrial facilities. Within .25 miles of the site along Valley View Road are Valley View Apartments, power lines, and a small pond. The nearest dwellings to the site are the Valley View apartments located about 100 yards northeast of the site. Water is available to area residents and businesses through a public water supply system. No groundwater supply wells exist at the site or in the vicinity.

2.1 Site Location

The Site is located on the northwest side of Fountain Inn within Greenville County, South Carolina. The City of Fountain Inn is approximately 15 miles southeast of Greenville, South Carolina. The Site is 1.3 acres at latitude 34° 41' 53.8" and longitude 82° 12' 48.8". The Site is the former location of a sewage treatment system, comprised of a sewage lagoon, sludge drying beds, and related treatment equipment. The Site is fenced with a locked gate and has signs posted identifying it as a Superfund Site.

2.2 Topography

Greenville County is located in the north central part of South Carolina in the Piedmont Physiographic Province. The Piedmont Province is characterized by rolling rounded hills, and long rolling, northeast-southwest trending ridges. Most of this area is gently sloped with area near creeks and streams having more moderate to steep slopes. Greenville County generally slopes southeasterly, which is the prevalent direction of drainage. While the highest point in Greenville County is 3,297 feet, the elevation around the Site ranges from 700 to 1200 feet.

More specifically, the area around the Site is gently sloping to moderately steep. Elevations in the immediate area range from approximately 900 feet MSL west of Fountain Inn to 790 feet

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northwest of the Site along Howards Branch. The topography around the Site is shown in Figure 1.

The elevation of the Site ranges between 860 feet at sampling location P7 at the east of the site to 819 feet at the surface water sampling station SW1 on Howards Branch. In general the Site slopes westerly towards the unnamed creek west of the lagoon and toward the northwest and Howards Branch.

2.3 Meteorology

South Carolina has a climate with mild winters and warm humid summers. The average daily maximum temperature for Greenville County is 71°F and the average daily minimum temperature is 52°F. In summer the temperature rises above 90°F for an average of 56 days, but seldom reaches above 100°F. Winter in Greenville County is mild and the temperatures are above freezing about 50 percent of the time.

Annual rainfall in Greenville County averages between 47 to 51 inches, well distributed through the year. May and November receive the least average rainfall per month (approximately 3.0 inches). March and July have the highest average rainfall per month (over 5.0 inches). Snowfall of over an inch occurs an average of only four days per year.

Severe weather such as tornadoes, tropical storms, and hurricanes can occur in the area. No full-fledged hurricanes have been recorded in Greenville County in the last 70 years. Violent storms with heavy rains and damaging winds occur only once every 5 to 10 years. Prevailing winds in Greenville County are from the northeast in the autumn and winter and from the southeast in spring and summer. The average wind speed is about eight miles per hour.

2.4 Regional Geology

Greenville County lies within the Inner Piedmont Belt of the Piedmont Geologic Province. Most of Greenville County is located on the inner Piedmont Belt of the Piedmont Plateau; whereas, the northern 25 percent of the county is located on the Blue Ridge mountains. The Blue Ridge and Piedmont are generally made up of the same kind of rock. The geology of this area is characterized by medium to high grade metamorphic rocks of Precambrian to early Paleozoic age. Some areas of alluvium exist along stream valleys. The metamorphic rocks generally consist of metasediments and meta-igneous rocks including hornblende-

gneiss, granite, and schists. These rocks weather to clay-rich soils and saprolite. The soils and saprolites range from approximately 5 to 100 feet thick in most areas and may be thicker along some ridge areas. Structurally, the area is characterized by northeast trending lineations which generally dip to the southeast. Structural features include recumbent folds, cross-folds which trend northwest-southeast, faulting, and igneous intrusions. The rock units are highly deformed. Granitic and gabbroic intrusions are common in the Piedmont Province. The inner Piedmont belt is the most intensely deformed and metamorphosed segment of the Piedmont. The northeast-trending Bervard fault zone forms much of the boundary between the Blue Ridge and Piedmont belts. Although this zone of strongly deformed rocks is one of the major structural features in the southern Appalachians, its origin is poorly understood.

The regional geology consists of highly metamorphosed gneiss and schists, with igneous rock intrusions that are covered by a mantle of weathered rock material called saprolite. Saprolite is a result of rocks that have weathered in place as a result of chemical alteration from infiltration of rainwater. Saprolite exhibits some structural and mineralogical characteristics of the underlying parent rock such as foliation, bedding and fractures. The weathering of rock into saprolite has changed the mineralogy of the rock by more clayey and sandy conditions. These mineralogics have produced an upper soil horizon in many places. That has been further altered by decaying vegetation where the structures sometimes found in deeper saprolite are no longer visible. There are eight geologic formations in Greenville County. These formations are made of alluvium, fine-grained rocks, fine-grained to medium-grained rocks, and coarse-grained rocks. Alluvium consists of material recently deposited on flood plains. The fine-grained rocks are diabase dikes that cut across formations of granite and gneiss. The fine-grained to medium-grained rocks are biotite gneiss, biotite schist, and megmatite. The fine-grained to coarse-grained rocks are biotite schist and hornblende gneiss. The medium-grained rocks are biotite granite gneiss and granite undivided. The coarse-grained rocks are muscovite pegmatite dikes.

2.5 Regional Hydrogeology

The area hydrogeologic setting consists of an unsaturated zone consisting mostly of saprolite extending from the surface down to a water table aquifer. The saprolite or in some places alluvium is recharged by precipitation which infiltrates from the surface and moves downward to form the water table. The water in the

shallow water table aquifer moves downgradient until it discharges into springs and streams. The surface of the water table is a subdued replica of the topographic surface and is generally near the surface near streams (discharge areas) and is somewhat deeper beneath ridges and hills (recharge areas).

Groundwater in the Piedmont Province is found in alluvial materials, saprolite, and, to a limited extent, in bedrock. Groundwater moves freely in the more permeable unconsolidated alluvium along stream valleys and river banks. Groundwater also moves fairly easily through the saprolite and weathered rock zones. The availability of groundwater in an area depends upon rock type, thickness of soils and saprolite, extent of fracturing, joints, schistosity in the rock, and the amount, distribution, and density of rainfall.

3.0 SITE HISTORY AND REGULATORY HISTORY

3.1 Site History

A wastewater treatment plant, which consisted of a modified activated sludge system, was built at the site location in 1951. It was constructed to treat industrial wastewater from a knitting, dyeing, and finishing plant that was located approximately 400 yards to the east. The treatment plant units included a bar screen, an aeration basin (lagoon), an aeroaccelerator, a clarifier, and a post aeration tank. "As built" drawings for these units could not be located, but these units were believed to be located as indicated on Figure 2. The original design of the plant was to provide treatment for an average flow rate of 300,000 gallons per day (gpd) of textile wastewater. The lagoon had a volumetric capacity of 430,100 gallons and received wastewater via a pipeline (the influent pipe).

In 1973, wastewater from the plant was described as passing through an oil separator into the lagoon. The lagoon was equipped with five 15 h.p. aerators, which were also used to supply air to the aeroaccelerator. The wastewater discharge may also have been treated with coagulants and neutralizers, e.g., lime and alum, in the clarifier at the lagoon site. A suction pump was operated to return collected sludge from the aeroaccelerator to the lagoon. A sludge drying bed, located approximately 20 yards north of the lagoon, was used to dry accumulated waste sludge from the treatment operation. The lagoon was designed to discharge into an unnamed creek that is located to the west end of the lagoon. There may also be a

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pipeline that bypassed flow around the lagoon and discharged flow to the unnamed creek. The unnamed creek flows northwest and eventually joins Howards Branch.

The lagoon was originally put into operation in October 1952, and accepted treated wastewater from knitting and dyeing operations for a textile plant manufacturing fabric for wearing apparel. Records available do not permit an accurate summation of the chemicals used or quantities discharged. However, the following substances were germane to the textile knitting industry and may have been used: soluble and insolubilized wetting agents, dispersing agents, surfactants, defoamers, soaps, detergents, weightors, direct, vat, naphthol, acid, and disperse dyes and pH adjusters. Although these materials may have been used in the process, it is unlikely that all of them would be present in the wastewater. These materials were highly diluted by successive rinses. Others reacted and were neutralized or precipitated out during the dyeing process, prior to the subsequent final treatment through the wastewater treatment system. Many substances were absorbed in the materials being dyed, particularly the dyes.

The flow rates to the treatment plant varied with the production rate of the plant. The design capacity of the treatment plant, constructed in 1951, was 300,000 gpd. By 1963, the discharge flow rate increased to 750,000 gpd. In 1966, the design capacity of the treatment plant was rated at 600,000 gpd. In 1976, the permitted discharge flow rate was 540,000 gpd. In September/October 1977, the discharge of wastewater to the lagoon from the knitting, dyeing, and finishing plant was discontinued due to the plant's shutdown. From December 1977 until sometime in 1988, the discharge to the lagoon consisted of water from roof drains, a cooling tower blowdown, and chiller overflow.

In 1979 the plant operators determined that the former wastewater treatment structures on the site should be razed, and that the then-existing lagoon be filled. The City of Fountain Inn demolished a small brick building and miscellaneous structures on site, graded the site, and partially filled the lagoon with the demolition debris and surrounding soil. Additional fill from the

tennis ball manufacturing facility was placed in the lagoon and was comprised of thin sheets of blue polyethylene, rubber tennis ball and racquet ball flashing and cores, tennis and racquet ball containers, excess tennis ball felt, golf balls, old roofing material, wooden pallets, and surrounding soils.

During a site inspection in 1985, South Carolina Department of

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Health and Environmental Control (SCDHEC) personnel noted that a portion of the site fence was missing. Wilson Sporting Goods (tennis ball manufacturer) subsequently repaired the site fence. The fence is inspected on a regular basis. The Site has remained inactive since 1988 and access is restricted by the fence and locked gate.

3.2 Regulatory History

Regulatory involvement on the site began in the early 1970s when citizens complained to SCDHEC regarding discoloration of the "stream below Beaunit" (probably referring to the unnamed creek and Howards Branch). On November 7, 1973, SCDHEC conducted a public hearing to consider whether possible violations of South Carolina's Water Classification System had occurred. SCDHEC conducted a site investigation on June 13, 1985, and reported detections of volatile organic compounds in surface water samples collected from the lagoon and nearby unnamed creek, and PCBs and metals in the soil and sediment samples collected from the Site. Based on the results obtained from SCDHEC's 1985 site investigation, EPA developed a Hazard Ranking System (HRS) score of 32.44 for the Site. In June 1988, EPA proposed to include the Site on the National Priorities List (NPL). The Site is ranked amongst the Group 18 sites (HRS scores 32.87 - 31.94) on the NPL.

The United States Environmental Protection Agency (EPA) negotiated an Administrative Order by Consent (AOC) with Continental Assurance Company, El Paso Natural Gas Company, Kayser-Roth Corporation, PepsiCo, Inc., and Wilson Sporting Goods Co. (Respondents) regarding the Beaunit Corp. Circular Knit and Dyeing Plant Site (Site). The AOC was negotiated under Sections 104, 122(a) and 122(d) (3) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. 9604, 9622(a) and 9622 (d) (3). The Respondents (hereinafter referred to as the Beaunit Lagoon Site Group) agreed to comply with the AOC effective February 21, 1992.

The AOC and the Scope of Work (SOW), incorporated therein by reference, required the Beaunit Lagoon Site Group to conduct a remedial investigation and feasibility study (RI/FS) of the Site

in accordance with the National Oil and Hazardous Pollution Contingency Plan (NCP), as codified in the Code of Federal Regulations, Title 40, Part 300 (40 CFR 300). The Beaunit Lagoon Site Group retained Engineering Science to conduct the RI/FS of the Site.

The Beaunit Lagoon Site Group submitted a draft RI/FS Work Plan,

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a draft Sampling and Analysis Plan (SAP), and a draft Health and Safety Plan (HSP) to EPA Region IV on May 29, 1992. EPA's review comments on the draft RI/FS Work Plan and the draft SAP were addressed in a final RI/FS Work Plan and a final SAP which were submitted to EPA Region IV on August 17, 1992. The comments on the draft HSP were addressed in a final HSP. The Beaunit Lagoon Site Group received comments from EPA on the final RI/FS Work Plan and the final SAP. The Beaunit Lagoon Site Group submitted a response to comments (i.e., EPA's review comments on the final plans) to EPA Region IV on September 15, 1992. Also, the Beaunit Lagoon Site Group submitted a revised final RI/FS Work Plan and a revised final SAP to EPA Region IV on September 30, 1992. EPA approved the revised final RI/FS Work Plan and the revised final SAP on October 9, 1992.

Engineering-Science conducted initial site surveys (i.e., geophysical and topographical surveys) in April 1992. The information obtained from those surveys was used to prepare the RI/FS Work Plan and the SAP. ES began mobilization on October 12, 1992 for performing the remaining RI ,field activities at the Site. ES conducted field activities at the Site from October 19, 1992 to December 10, 1992. The Preliminary Site Characterization Summary (PSCS) was submitted to EPA Region IV on February 16, 1993. All information from the PSCS and additional findings on the fate and transport of contaminants are contained in the RI report.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Initial RI/FS community relations activities at the Beaunit Circular Knit & Dyeing NPL Site began with extensive community interviews in Fountain Inn during May, 1992 and the finalization of a Community Relations Plan in August, 1992. Area residents around the site, local government officials both elected and appointed, local business leaders, and the local newspaper staff were all interviewed. There was little knowledge about the site and some confusion with other remediation efforts from a mineral spirits spill from the Wilson Sporting Goods Plant. There were unrelated concerns also expressed regarding odor problems from the Wilson facility. There was some overall concern regarding

children's exposure to the site. All concerns raised were responded to during the interviews and later public meetings. Additionally, an information repository was established at the Fountain Inn Public Library on Main Street.

An initial fact sheet announcing the start of the RI/FS was issued in August, 1992. Community interest during the RI/FS

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preparation was very low. EPA received only a few telephone calls regarding the Site or the RI/FS study. EPA has regularly updated the Site Information at the Information Repository and posted signs on the Site perimeter fencing and the gate listing. contacts at EPA and SCDHEC. The Site is fenced and routinely inspected for signs of trespassing.

Following completion of the RI and the FS, the Site mailing list was updated and the Proposed Plan was mailed out in late October, 1994. Both the advertisement and the Proposed Plan stated that the Public Comment period would be from November 7, 1994 to December 7, 1994.

The Proposed Plan public. meeting was held on November 14, 1994, to present the Agency's selection of Preferred Alternatives for addressing contamination at the Site. The local newspaper, several citizens, and representatives from the Potentially Responsible Parties were present. In early December a request was received to extend the public comment period to provide additional time for review of the Proposed Plan and the RI/FS documents. EPA approved the request and extended the comment period to conclude on January 13, 1995.

EPA received three written comments during the public comment period. EPA's responses to the comments are contained in the Responsiveness Summary, Appendix B to this document. Other documents related to public participation at this site including copies of the advertisements for the public meetings, the initial comment period and its extension, as well as the transcript of the public meeting are also included in appendices to this document. This decision document presents the selected remedial action for the Beaunit NPL Site, in Fountain Inn, South Carolina, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the NCP. The decision of a remedial action for this Site is based on the Administrative Record.

5.0 SCOPE AND ROLE OF THIS ACTION WITHIN SITE STRATEGY

The site principally poses a threat to the environment through contaminated surface soils. The contaminated soils could cause

deleterious effects to environmental receptors who ingest organisms living in the contaminated soils. A possibility exists that contaminants in the soils could leach into the shallow groundwater aquifer. While the shallow groundwater aquifer is not utilized as a potable water source, it is used for irrigation from a few wells in the vicinity of the site. The contamination at the site does not pose an unacceptable risk for human health

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at the site at present or in the unlikely scenario of future residential usage at the site. EPA's plan for remediation of the Beaunit Site will address all threats posed by the Site, namely contaminated soil on-Site and potential groundwater contamination by leaching of the soils on-Site. This is the only ROD contemplated for this Site.

6.0 SUMMARY OF SITE CHARACTERISTICS

6.1 Surface Water Hydrology

Surface water is present at the Site in the lagoon, and in small streams, drainage pathways and a small man-made pond adjacent to the Site. A small unnamed creek located west of the Site flows north and discharges to Howards Branch about 500 feet northwest of the Site. Howards Branch eventually joins Durbin Creek. Durbin Creek is a tributary of the Enoree River. Both Durbin Creek and the Enoree River are classified as Class B streams by South Carolina. Streams and ponds in the area of the site are shown in Figure 3.

The lagoon currently is about 7,000 square feet, containing rain water accumulation and groundwater infiltration from the water table. While the water level in the lagoon varies, it is never dry, and at the time of the Remedial Investigation was 3 feet in depth.

Sediments along the unnamed creek and Howards Branch were collected. The sediments were generally sands, gravel, silts, and clay. The bottom of the lagoon contains a sludge layer about one foot thick containing a small amount of textile threads. Below this sludge layer are soils similar to other collected elsewhere around the site.

6.2 Site Hydrogeology

Seven groundwater monitoring wells were installed at the Site during the RI field activities. A summary of well construction and water-level data is presented in Table 2.2 of the Remedial Investigation. Five monitoring wells are shallow (MW1S, MW2S,

MW3S, MW4S, and MW5S), ranging in depth from 20 to 27.5 feet BLS. Two monitoring wells (MW1D and MW5D) are screened deeper (55 feet

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BLS and 57 feet BLS) to provide information on the vertical direction of flow. The upgradient monitoring wells are MW1S, MW1D, and MW2S. The downgradient monitoring wells are MW3S, MW4S, MW5S, and MW5D. Depth to groundwater across the Site ranged from approximately 3 feet below the top of casing in MW5S to 11 feet below top of casing in MW2S.

General groundwater flow directions across the Site are from south-southeast to north-northwest. The movement of groundwater at the Site generally follows the topography which slopes northwesterly. Groundwater leaving the Site discharges into the unnamed creek and Howards Branch. The well pair (MW1S and MW1D) located upgradient of the Site indicate that groundwater in this area has a downward vertical gradient, which is consistent with an area of groundwater recharge. The vertical gradient at the well pair farthest downgradient of the Site (i.e., MW5S and MW5D near the unnamed creek) is upward, which is consistent with an area of groundwater discharge. The horizontal gradient across the Site was determined to be approximately 0.038 ft/ft. Slug tests were performed on all monitoring wells. The average hydraulic conductivity was 11.41 ft/day and the average velocity of groundwater flow, for an effective porosity of 0.15, was approximately 2.88 ft/day.

6.3 Site Geology

Soil borings were drilled at various locations across the Site. These borings ranged in depth from about 6 feet to 100 feet. The borings encountered fill materials and residual or saprolite soils consisting of sands, silts, and clays, and weathered rock. Bedrock was encountered in only one of the borings drilled near a rock outcrop during this investigation at a depth of 9 ft. Bedrock is a biotite gneiss, and is probably deeper than 100 feet below land surface (BLS) over most of the Site. However, rock was encountered very shallow at one location (SB3) north of the Site. In the immediate area of this boring rock is exposed at the surface. Sand, silt and clay were encountered in several

borings. Biotite and quartz were the two major mineralogical constituents found in the soils at the Site. A micaceous saprolite exhibiting a gneissic texture was encountered at an average depth of 7.5 feet BLS.

6.4 Site Soils

The surficial soils in the vicinity of the Site have been identified as Cecil and Appling soils, which consist of Cecil sandy and Appling sandy loam. These soils, are derived from

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saprolite that has weathered from the underlying bedrock of granite, gneiss, or schist. The surficial soils are well drained.

Cecil soils have a surface layer of dark-brown sandy loam. The subsurface soil is normally a yellowish-red sandy clay loam in the upper part, red clay in the middle, and red sandy clay loam in the lower part.

Appling soils have a surface layer of dark grayish-brown sandy loam. The subsurface soil is normally a light yellowish-brown clay in the upper part, yellowish brown and reddish-yellow clay in the middle, and mottled brownish-yellow, brown, and red clay in the lower part.

The soils at the Site have been identified as Cecil soils which consist of sandy loam. The estimated soil depth is 0 to 6 feet. The soils at the Site are fairly permeable.

6.5 Site Biota

Investigative methods for establishing aquatic and terrestrial resource characteristics included a field reconnaissance survey conducted April 6 and 7, 1993, contact with local resource authorities, and compilations of existing information. The characterization investigations focused on the aquatic and terrestrial resources of the Site and the area within a half-mile radius of the Site. A walk-through survey of the Site was conducted. Five natural resource categories were examined: vegetation, aquatic life, wetland resources, wildlife, and species of concern. Each resource description addresses general community and habitat characteristics and environmentally sensitive areas or aspects. All descriptions were based on a two-day field reconnaissance conducted by ES personnel, except where noted.

6.6 Vegetation

The type, composition, location and general appearance of vegetation were determined from observations made during the field reconnaissance survey. Site aerial photographs (scales ranging from 1:1,900 to 1:5,400) and the USGS Fountain Inn Quadrangle (7.5 minute series) were used to locate and map boundaries of each vegetation type that was identified in the field. Technical documents were also referenced to support the field assessment.

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The approximate location and extent of vegetative cover types are shown on Figure 4. A list of species identified during the field reconnaissance is provided in Appendix B of the RI. There are no vegetation types of major economic importance or that represent a resource of unique or special concern. All types are widely distributed and abundant throughout the vicinity. The mixed hardwood-pine forest and scrub or old fields are described below.

6.6.1 Mixed Hardwood-Pine Forest

A natural plant community, the successional mixed hardwood-pine forest, was recognized outside the Site, within the one-half mile radius of the Site. The predominance of this community is due primarily to the fact that the study area is located on well-drained upland soils of two major soil series, the Appling and Cecil series. Soils in these series consist of sandy loams. The soils are described as low in natural fertility and slightly to moderately acidic. Water capacity is moderate and erosion is reported as a moderate hazard (SCS 1975).

A third soil type, the Wehadkee soils, is found along and adjacent to the streams and drainageways in the study area. This poorly drained soil, has moderate organic content and moderate natural fertility. Flooding is a major concern. The mixed hardwood-pine plant community is also supported on this soil with an increase in the plants more tolerant of wetter soils (e.g., red maple, water oak).

The mixed hardwood-pine successional forest is characteristic of a very large portion of the Piedmont physiographic region, especially where the soils are well drained and slightly to moderately acidic. Random pH readings of 6 were noted for the soils in the study area. White oak, southern red oak, water oak, sweet gum, tulip-poplar and shortleaf pine are common tree species in the vicinity of the Site. Pines are generally absent along the stream corridors while sweet gum and red maple occur more frequently in these areas. The subcanopy is composed of

black cherry, *Rubus* sp., red cedar, and American holly.

Species diversity of ground cover in the forested areas appeared to be somewhat low. Most prominent in the herbaceous layer were species such as spotted wintergreen, sphagnum moss, lycopodium, yellow wood sorrel, blue violet, and bird's foot violet. Common vines observed in the area included poison ivy, greenbrier, and Japanese honeysuckle. Kudzu occurred along Howard Branch, west

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of Valley View Road. Cane was observed infrequently. Forest cover in the immediate vicinity of the Site is similar in composition and condition to other forested areas observed throughout the one-half mile study area.

Portions of the plant community have been substantially altered due to roadbuilding, utility corridor clearing, sewer routing/installation and home-building. Historic aerial photos indicate that much of the forested area adjacent to the Site had been cleared and was utilized for agricultural purposes prior to approximately 1965. Remnants of terracing were observed in wooded areas east of the Site during the field reconnaissance.

6.6.2 Old Field/Scrub/Pasture

Deforestation and subsequent regeneration has occurred in several locations within the study area resulting in the occurrence of old field and scrub vegetation. The Site, mowed routinely, is comprised mainly of early successional herbaceous and woody plants. For example, willow is regenerating on some portions of the Site. Shrubs occur around the perimeter of the lagoon and on the berm. Species included willow, rush, honeysuckle, *Rubus* sp., greenbrier. The area bordering the west side of the lagoon outside of the Site is within the power easement and the saplings and shrubs have been periodically cut.

6.7 Aquatic Life

Surface water is present in a lagoon at the Site and in small streams, drainage pathways and two small, man-made ponds within the study area. Sections of the small streams and ponds in the

study area may support populations of aquatic organisms. According to Mr. Gene Hayes, District Fisheries Biologist with the South Carolina Wildlife & Marine Resources Department (SCWMRD), no data is available for Howard Branch or other water bodies within the study area. However, limited data exists for Durbin Creek into which Howard Branch flows nearly 2.5 miles to the northeast of the Site. Physical conditions of the streams and ponds within the study area were recorded and random observations of benthic life were noted. The streams and ponds within a one-half mile radius of the Site are shown on Figure 3, included previously in this Record of Decision.

6.8 Wetland Resources

Wetland resources were identified on the Site and within the study area using aerial photographs, the USGS topographic map and

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the Greenville County soil survey (SCS 1975). Potential wetland areas were then verified by field inspection. No jurisdictional delineations were conducted; however, wetland areas were identified generally using criteria set forth in the U.S. Army Corps of Engineers (COE) 1987 Wetlands Delineation Manual.

6.9 Wildlife

The presence and current status of wildlife resources were determined primarily by reviewing existing information sources, by interviewing local authorities and agency personnel, and by conducting a field reconnaissance. Typical wildlife habitats, uses, and prevalent species were noted during the field reconnaissance. Availability of relevant data on wildlife species is limited. The presence and status of endangered, threatened, and special-concern species were determined primarily by reviewing existing information sources. Potential habitat occurrence within the vicinity of the site was also evaluated during the field reconnaissance. Technical documents received from the SCWMPD Heritage Trust Section (Boyle 1993) and the U.S. Fish and Wildlife Service (EuDaly 1993) were reviewed to identify the species of concern.

Numerous game and nongame species exist in the area of the site. The actual proportions of the wildlife population are unknown. Larger species may be excluded from the Site due to a chainlink fence topped with three-strand barbed wire surrounding the Site. Smaller animals may gain access to the Site under the fence. No animals or signs were observed inside the fence and there was no evidence of burrowing on the Site.

Typical mammals that may be found in the area include rabbit, skunk, opossum, raccoon, deer, fox, and squirrel. During the field reconnaissance, signs (scats and tracks) of rabbit and raccoon were found throughout the study area. A deadshrew was observed in a wooded area east of the substation. No signs of deer were observed although the habitat conditions of the study area offer food and cover.

Birds noted in the area during the site reconnaissance include mourning dove, common crow, robin, bluejay, mockingbird, wood thrush, red-tailed hawk, northern cardinal, common flicker, chickadee, killdeer, downy woodpecker, Canada goose and green heron.

The site and surrounding area generally provides less than optimal wetland and riparian habitats to accommodate waterfowl

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populations or uses. Waterfowl may utilize the pond adjacent to the Site and the Howard Branch headwater pond for resting and foraging. Signs of wading birds were observed in the unnamed creek downstream of the pond and in Howard Branch downstream of its confluence with the unnamed creek. In addition, a green heron was observed near Howard Branch during the field reconnaissance.

There is no information available concerning reptiles and amphibians commonly found in the study area. No reptiles or amphibians (other than tadpoles on the Site) were observed during the field reconnaissance.

6.9.1 Endangered, Threatened, and Special-Concern Species

A status review was conducted of all potential plant, wildlife, and fish species reported from the region. There are no known resident populations or designated critical habitats for any state or Federally listed threatened or endangered species occurring on the Site or within a one-half mile radius of the Site. In addition, no populations or supporting habitats were observed on the Site or in the study area for species of special concern.

7.0 SUMMARY OF SITE RISKS

7.1 Remedial Investigation

The AOC and the Scope of Work (SOW), incorporated therein by reference, required the Beaunit Lagoon Site Group to conduct a remedial investigation and feasibility study (RI/FS) of the Site

in accordance with the National Oil and Hazardous Pollution Contingency Plan (NCP), as codified in the Code of Federal Regulations, Title 40, Part 300 (40 CFR 300). The Beaunit Lagoon Site Group retained Engineering Science, an Atlanta consulting firm, to conduct the RI/FS of the Site.

The Beaunit Lagoon Site Group submitted a draft RI/FS Work Plan, a draft Sampling and Analysis Plan (SAP), and a draft Health and Safety Plan (HSP) to EPA Region IV on May 29, 1992. EPA's review comments on the draft RI/FS Work Plan and the draft SAP were addressed in a final RI/FS Work Plan and a final SAP which were submitted to EPA Region IV on August 17, 1992. The comments on the draft HSP were addressed in a final HSP. The Beaunit Lagoon Site Group received comments from EPA on the final RI/FS Work Plan and the final SAP. The Beaunit Lagoon Site Group submitted a response to color, Lents (i.e., EPA's review comments on the final

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plans) to EPA Region IV on September 15, 1992. Also, the Beaunit Lagoon Site Group submitted a revised final RI/FS Work Plan and a revised final SAP to EPA Region IV on September 30, 1992. EPA approved the revised final RI/FS Work Plan and the revised final SAP on October 9, 1992.

Engineering-Science conducted initial site surveys (i.e., geophysical and topographical surveys) in April 1992. The information obtained from those surveys was used to prepare the RI/FS Work Plan and the SAP. ES began mobilization on October 12, 1992 for performing the remaining RI field activities at the Site. ES conducted field activities at the Site from October 19, 1992 to December 10, 1992. The PSCS was submitted to EPA Region IV on February 16, 1993. The information contained in the PSCS along with information on the fate and transport of contaminants are presented in the RI report.

7.1.1 Remedial Investigation Field Activities

The RI field activities were as follows:

Topographical and geophysical surveys in April 1992 before preparing the draft RI Work Plan;

Installed seven (three upgradient and four downgradient) monitoring wells;

Collected groundwater samples from monitoring wells;

Collected surface water and sediment samples from the lagoon, the unnamed creek, a pond (located upstream of the unnamed creek),

and Howards Branch;

Collected surface soil samples from 24 locations that included 3 background surface soil samples;

Collected subsurface soil samples from 15 soil borings that included 3 background soil borings, 5 soil borings along the influent pipeline to the lagoon, 2 soil borings along an effluent pipeline from the lagoon, 2 soil borings in the former sludge drying bed area, and 3 soil borings in the fill material area;

Surveyed monitoring wells and sampling locations; and conducted biota survey.

The sampling locations for surface water, sediment samples, groundwater samples, and surface soil samples, and the data

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collected are shown in attached Figures 5, 6, 7, 8, 9, 10, 11, & 12.

7.2 Remedial Investigation Conclusions

The conclusions presented in this section are based on the site background and setting, the physical characteristics of the study area, the nature and extent of contamination, and the fate and transport of contaminants.

- * The potential contaminants of concern for surface soil are polynuclear aromatic compounds (PNAs), arsenic, and manganese.

- * The potential contaminants of concern for subsurface soil are PNAs and manganese.

- * The potential contaminants of concern for lagoon sediments are polychlorinated biphenyls (PCBs), benzo(a)pyrene, antimony, beryllium, and manganese.

- * The potential contaminants of concern for lagoon surface water are arsenic, barium, and manganese; none of these metals exceed drinking water standards.

- * The potential contaminants of concern for groundwater are barium, chromium, and manganese; none of these metals exceed drinking water standards.

- * The rock outcrops and the unnamed creek are the controlling features for the groundwater in the vicinity of the Site; the groundwater flows towards the unnamed creek and has an upward

component near the unnamed creek.

* From the standpoint of human health or environmental risk the four elements of a migration pathway, i.e., an affected source, a transport medium, an exposure pathway, and an exposure source must occur for the pathway to be considered as complete. The evaluation of contaminant transport from the affected areas at the site indicates that the potential contaminants of concern are not likely to migrate. Therefore, the migration pathways for the potential contaminants of concern at the site are not likely to be completed.

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7.3 Summary of Risk Assessment

CERCLA directs EPA to protect human health and the environment from current and potential future exposure to hazardous substances at the site. A risk assessment was conducted to evaluate the potential current and future risks associated with exposure to the site contaminants.

The Baseline Risk Assessment (BRA) for the Site was prepared by Roy F. Weston, Inc. for EPA Region IV. The BRA was finalized on November 24, 1993. EPA determined as a result of the risk assessment that potential future residential exposures to benzene, beryllium, chromium, manganese, 2-methylnaphthalene, and naphthalene in groundwater were of concern. It should be noted these risk levels incorporated both site related and background related risks (since some contaminants such as beryllium, chromium, and manganese, existed in the study area naturally). EPA determined that the risks to human health from contaminants in surface soils were within EPA's acceptable risk range and stated that remediation of surface soils, would not be required for the protection of human health. However, the BRA also determined that site surface soils did present a risk to ecological receptors. Arsenic and nickel were identified as the chemicals of concern. While EPA determined that there were no significant concerns over surface soil contamination as applied to human health, the agency required that soil contamination

still be addressed in the feasibility study for the Site because of concern for ecological receptors. Subsurface soil, surface water and sediments were not identified as media of concern for the Site. The contaminants of concern, exposure concentrations, risk levels, and hazard indices are provided in Tables 1.1 & 1.2 of the Feasibility Study.

Actual or threatened releases of contaminants from the site, if not addressed by one of the alternatives in this plan, may present an imminent and substantial endangerment to public health, welfare or the environment.

7.3.1 Human Risk

An evaluation was made of all potential exposure routes which could connect contaminants of concern (COC's) at the Site with people living or working in the area. Exposure by each of these pathways was mathematically modeled using generally conservative assumptions. Of the five media (surface water, sediment, groundwater, surface soil, and subsurface soil) investigated during the RI, groundwater was identified in the BRA as the only

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media of concern for human receptors.

The EPA determined that the contaminants of concern associated with groundwater were benzene, beryllium, chromium VI, manganese, 2-methylnaphthalene, and naphthalene. Of these contaminants, benzene and beryllium are classified as carcinogenic constituents and chromium VI, manganese, 2-methylnaphthalene, and naphthalene are classified as noncarcinogenic constituents. Carcinogenic and noncarcinogenic risk levels for contaminants in groundwater were presented in the final BRA. Carcinogenic risks are presented as an incremental risk to a population subgroup, e.g., child, and noncarcinogenic risks are presented as hazard indices in Table 1.

7.3.2 Environmental Risk

A qualitative risk assessment was conducted to determine if contaminants present at the site have impacted plant life or animals in the area. Given the small size and industrial nature of the site, significant impact to local plants and animals are not expected. While endangered or threatened species have been identified in this area of the State, none were specifically located at the Site during the RI/FS. Regardless, the environmental risk assessment did indicate that surface soil exposure to environmental receptors would need to be addressed in the development of remediation alternatives.

Of the five media investigated during the RI, the baseline risk assessment determined that surface soil is the only medium of concern for ecological receptors. Arsenic and nickel are identified as the contaminants of concern (those that exceed an ecological hazard index of 1.0 in surface soil) in the final BRA. The hazard indices for these contaminants are listed in Table 1.

The risk posed to terrestrial wildlife was based on arsenic and nickel detected in surface soil samples. The arsenic and nickel concentrations used to compute risks were 9.71 mg/kg and 8.08 mg/kg, respectively. The background arsenic concentrations at the Site are 3 mg/kg (SB1, 0-2 ft), 1.2 mg/kg (SB2, 0-2 ft), and 5.6 mg/kg (SB3, 0-2 ft). Nickel was detected only in the SB1 (0-2 ft) background sample at a concentration of 4.2 mg/kg. Nickel was not detected at SB2 (0-2 ft, 1.9U mg/kg) and SB3 (0-2 ft, 7.1U mg/kg). The average elemental concentrations for arsenic and nickel in United States soil and other surficial materials are presented in Table 2.1 of the BRA. The site-specific averages for arsenic and nickel are less than the reported average elemental concentrations in United States soil.

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Table 1
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Baseline Risk Assessment Summary
RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site
Fountain Inn, South Carolina

Subgroup		Risk	Exposure	Risk	Hazard
Medium	Chemical	Type	Concentration(1)	Level	Index
Type					
		Human Health			
Groundwater not specified	Benzene	Carcinogenic	11 ug/L	1E-05	na
Groundwater Child	Chromium	Noncarcinogenic	39.7 ug/L	na	1
Groundwater Child	Manganese	Noncarcinogenic	2620 ug/L	na	67
Groundwater Youth	Manganese	Noncarcinogenic	2620 ug/L	na	22
Groundwater Adult	Manganese	Noncarcinogenic	2620 ug/L	na	14

Groundwater Child	2-Methylnaphthalene	Noncarcinogenic	19.5 ug/L	na	7
Groundwater Youth	2-Methylnaphthalene	Noncarcinogenic	19.5 ug/L	na	2
Groundwater Adult	2-Methylnaphthalene	Noncarcinogenic	19.5 ug/L	na	1
Groundwater Child	Naphthalene	Noncarcinogenic	77.5 ug/L	na	27
Groundwater Youth	Naphthalene	Noncarcinogenic	77.5 ug/L	na	9
Groundwater Adult	Naphthalene	Noncarcinogenic	77.5 ug/L	na	6
Groundwater not specified	Beryllium	Carcinogenic	4.5 ug/L	4E-04	na

Terrestrial Wildlife

Surface Soil Least Shrew	Arsenic	na	9.71 mg/Kg	na	80.9
Surface Soil Least Shrew	Nickel	na	8.08 mg/Kg	na	1.85

(1) 95% upper confidence limit of the arithmetic mean of detections and 1/2 detection limit for nondetects,

or the maximum amount detected, whichever is less.

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7.3.3 Exposure Pathways and Receptors

The exposure routes for both the groundwater and surface soil were presented in the final BRA. There are no residents on the Site. The final BRA, however, states that there is the possibility of visitors gaining access to the Site and the surrounding areas. Hypothetically, a visitor (youth, 7 to 16 years old). is assumed to receive the maximum current chemical exposure from surface soil, surface water, and sediment during recreational activities. The potential carcinogenic risk for the hypothetical visitor does not exceed 1E-06, and the potential hazard index for the hypothetical visitor does not exceed 1.0.

The BRA also states that the Site has a reasonable potential to be developed for future residential use. Potential soil and groundwater exposure pathways were evaluated for children (less than 7 years old), youths (7-16 years old), and adults (older than 16 years) as future residents. The surface soil pathway is based on exposure through incidental ingestion, dermal contact, and inhalation of airborne soil/dust. Subsurface soil pathway

was not addressed since, as described in the BRA, "Exposure to contaminants detected in soil borings is not evaluated for either the current or future use scenarios because the depth at which the samples were taken precludes direct contact." The Site is currently owned by a Beaunit PRP. Therefore, the potential exposure to a hypothetical future resident could be eliminated through access and deed restrictions. The groundwater pathway is based on future site residents being exposed to the contaminants of concern through: (1) possible future off-site private drinking wells containing contamination (in the vicinity of the Site); or (2) the installation of a residential well onsite. The potential groundwater exposure pathways include ingestion of drinking water and non-ingestion uses (i.e., showering). However, the probability for completion of groundwater exposure pathways is very low because drinking water wells are not located on the Site or properties adjoining the Site. In addition, the probability of a future resident using the groundwater for ingestion (e.g., drinking) and non-ingestion (e.g., showering) purposes is low because the City of Fountain Inn supplies water to residents via a water distribution system. Therefore, a large uncertainty would be factored in the assessment of any future risks that are based on the completion of the groundwater exposure pathway.

In addition to these pathways, exposure to surface water and sediment (while playing in the unnamed creek, Howards Branch, and the lagoon) was evaluated for a resident youth (age 7-16 years

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old). These pathways include incidental ingestion and dermal contact with sediment and dermal contact with water.

The final BRA stated that the hazard indices were greater than a value of 1.0 for the hypothetical future child, youth, and adult resident due to the groundwater pathway. The final BRA also stated that the carcinogenic risk exceeded $1\text{E-}06$ for the unspecified, future, lifetime resident from the groundwater pathway. It should be noted, however, that according to calculations conducted outside the BRA, carcinogenic risk also exceeds $1\text{E-}06$ for groundwater at background quality due to beryllium and chromium. Additionally, according to calculations conducted outside the BRA, noncarcinogenic risks also exceeds a hazard index of 1.0 for groundwater at background quality due to manganese.

The final BRA also presented the ecological risk to terrestrial wildlife. The Least Shrew was chosen as the target species to represent terrestrial wildlife. The BRA determined that an adverse effect on the Least Shrew could result from exposure to chemicals of concern in surface soil at the Site. The surface

soil and groundwater pathways and receptors are described in the following subsections.

8.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

8.1 Scope of the Remedial Action

This Record of Decision for the Beaunit Superfund site addresses remedies for surface soil and groundwater contamination present at the site. Sediments and surface water were also sampled during the Remedial Investigation as well. The Remedial Action is necessary to protect the public and environmental receptors from exposures to contaminated surface soils and groundwater. Additional sources or operable units are not expected.

The FS for the Site included the following five phases: i) development of remedial action objectives (RAOs); ii) development of general response actions; iii) identification of potential Technologies and process options; iv) development and screening of potential technologies and process options; and v) development and detailed analysis of the proposed remedial action alternatives. The RAOs for groundwater and surface soil were developed based on the information provided to the Beaunit Lagoon Site Group by EPA. The general response actions for groundwater included no action, institutional controls, collection, and treatment. The general response actions for surface soil

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included no action, diversion of surface water, containment, and removal/disposal.

8.2 Remedial Goal Options for Groundwater (RGOs)

The Remedial Action Objective (RAO) for groundwater remediation at the Site is to prevent human exposure, via any exposure route [ingestion and non ingestion (i.e., showering)] to groundwater containing contaminants in concentrations that exceed ARARs and appropriate risk levels.

EPA required that the Remedial Investigation's terminology of Preliminary Remedial Goals (PRGs), be referred to as remedial goal options (RGOs). The RGOs for groundwater at the Site were developed for the future resident and they were calculated for the contaminants of concern in groundwater using the following equation:

$$RGO = (TR \times EC) / CR$$

Where:

RG0	Remedial Goal Options
TR	Target risk level (HQ = 1.0 for noncarcinogenic effects and risk level = 1E-06, 1E-05, and 1E-04 for carcinogenic effects).
EC	Exposure concentration in soil and groundwater.
CR	Calculated risk level

The RGO's for groundwater are shown in attached Table 2.

8.3 Remediation Goal Options for Surface Soil (RG0s)

The Remedial Action Objective (RAO) for surface soil remediation at the Site is to prevent exposure of terrestrial species to the contaminants of concern in surface soils above appropriate risk levels.

The RGOs for surface soil were computed using the same equation that was used for groundwater. The RGOs for the contaminants of concern i.e., arsenic and nickel in surface soil for ecological risk calculated based on a hazard index of 1 are presented in attached Table 3. The RGO for arsenic (0.1 mg/kg) calculated based on a hazard index of 1 is one order of magnitude lower than the

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concentrations of arsenic detected in background surface soil samples (SB1 3 mg/kg, SB2 1.2 mg/kg, and SB3 5.6 mg/kg). ARGO for arsenic lower than background concentrations would lead to a cleanup of the Site to below background value. Therefore, the RGO for arsenic should be based on background concentrations and not on the concentration calculated based on a hazard index of 1. An average background concentration of 3.2 mg/kg could be used as a RGO for arsenic in surface soil.

The concentration of nickel in surface soil based on a hazard index of 1 is 4.4 mg/kg. The concentration of nickel detected in background surface soil sample was 4.2 mg/kg. Therefore 4.4 mg/kg could be used as the RGO for nickel in surface soil.

8.4 Development of Alternatives

The NCP requires that the following alternatives be considered for development in-the Feasibility Study (FS) for a NPL site:

- * An alternative that removes or destroys the hazardous constituents to the maximum extent feasible and

eliminates the need for long-term monitoring and management;

- * One or more alternatives that reduce the toxicity, mobility, or volume of the hazardous constituents;
- * One or more alternatives that involve little or no treatment, but provide protection to human health and the environment by containing the hazardous constituents to control exposure to the wastes;
- * One that involves innovative treatment technologies if those technologies offer the potential for comparable or superior performance or implementability, fewer adverse effects, or lower costs than demonstrated technologies; and
- * The no action alternative.

Process options were identified for groundwater and surface soil based on the general response actions for each medium. The process options retained after initial screening phase for groundwater were natural attenuation, monitoring, groundwater pumping, precipitation, filtration, ion exchange, adsorption, and air stripping. The process options retained after the

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Table 2
Beaunit ROD Remediation Goal Options For Groundwater
RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site
Fountain Inn, South Carolina

		Remedial Goal Option	
Contaminant	Types of Risk	Risk-Based(1)	ARAR-Based
Human Health			
Benzene	Carcinogenic	2 to 200 ug/L	5 ug/L(2)
2-Methylnaphthalene	Noncarcinogenic	3 ug/L	NA
Naphthalene	Noncarcinogenic	3 ug/L	NA
Beryllium	Carcinogenic	0.01 to 1 ug/L	4 ug/L(2)
Chromium VI	Noncarcinogenic	40 ug/L	100 ug/L(3)
Manganese	Noncarcinogenic	40 ug/L	200 ug/L(4)

- (1) Carcinogenic risk-based remediation goals are based on the risk range 1E-6 to 1E-4
Noncarcinogenic risk-based remediation goals are based on a hazard index of 1.0.
- (2) ARAR-Based goal is based on MCL
- (3) ARAR-Based goal is for total chromium
- (4) ARAR-Based goal is based on MCLG
- NA - Not applicable

Table 3
Beaunit ROD Remediation Goal Options For Surface Soil
RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site
Fountain Inn, South Carolina

		Remediation Goal Options (RGOs)	
Contaminant	Types of Risk	Risk-Based	ARAR-Based
Terrestrial Wildlife			
Arsenic	Noncarcinogenic	0.1 mg/Kg(1)	NA
Nickel	Noncarcinogenic	4.4 mg/Kg(2)	NA

(1) Noncarcinogenic risk-based goal has been calculated based on a hazard index of 1.0.
The risk-based goal is
lower than average background concentration by atleast one order of magnitude.
Therefore, the average
background concentration of 3.2 mg/kg could be used as the RGO for arsenic in surface
soil.

(2) Noncarcinogenic risk-based remediation goal has been calculated based on a hazard index
of 1.0.
NA - Not applicable

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initial screening phase for soil were natural attenuation,
grading and drainage controls, native soil/clay cap, excavation
of surface soil, excavation of fill material, and off-site
disposal.

The process options were further screened based on their
effectiveness, implementability and cost. Eight remedial action
alternatives for the Site were developed based on the process
options retained after the screening phases. The remedial
action alternatives are shown in Table 4.

8.5 Summary of Alternatives

Based on the results of the RI/FS reports and the risk

assessment, cleanup levels were developed that would be protective of human health and the environment. These cleanup levels form the basis of any remedial activity. Various alternatives were evaluated in the FS report using these cleanup levels as goals for site cleanup. The ground water cleanup levels are based on state and federal standards, referred to as Maximum Contaminant Levels (MCLs). The soil/source cleanup levels were established to minimize site risks and insure future protection of ground water. The cleanup standards for the Beaunit site are presented in Table 2 and 3.

The FS report evaluated a variety of cleanup methods that could be used at this site. As required by CERCLA, a no further action alternative was evaluated to serve as a basis for comparison with the other active cleanup methods. The cleanup methods to address site related contamination which exceeds the cleanup goals are presented in this Record of Decision.

Costs shown in the Record of Decision for each alternative represent the midpoint of the low and high estimates for each alternative which are provided in greater detail in the Feasibility Study. A summary table of the high and low estimates for the costs of each alternative is attached as Table 5.

8.5.1 Alternative 1: No Action

A no action alternative is required by the NCP to be carried forward as a baseline for detailed comparison. Under this alternative no remedial actions will be conducted for groundwater and surface soil. Site monitor wells will be plugged and abandoned. The current site fence will not be actively maintained under this program. No groundwater monitoring or

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Table 4
Beaunit ROD

Remedial Action Alternatives
RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site
Fountain Inn, South Carolina

Alternative Number	General Response Action	Remedial Alternative
1	No Action	No Action Alternative
2	Institutional Controls (gw) / No Action (ss)	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use

Restrictions

3	Institutional Controls (gw) / Containment (ss)	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use
Restrictions / Cap		Grading-Drainage Control-Soil and Clay
4	Collection and Treatment (gw)/ Containment (ss)	Groundwater Pumping Treatment, Surface Water, and Sediment Monitoring Groundwater Use Restrictions / Grading-Drainage Control-Soil and Clay
Groundwater, and Cap		
5	Institutional Controls (gw)/Removal/Disposal of "Hot Spots" (ss)	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of
"Hot Material,		Spots", Off-site Disposal of Excavated and Backfill and Grade
6	Collection and Treatment (gw)/Removal/Disposal of "Hot Spots" (ss)	Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of
"Hot Material,		Spots", Off-site Disposal of Excavated and Backfill and Grade
7	Institutional Controls (gw)/Removal/Disposal of Site Surface Soils and Fill Area (ss)	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Surface Soils and Fill Area, and Off-
Site site Backfill		Disposal of Excavated Material, and and Grade
8	Collection and Treatment (gw)/Removal/Disposal of Site Surface Soils and Fill Area (ss)	Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Surface Soils and Fill Area, Off-site Excavated Material, and Backfill and
Site Disposal of Grade		

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Table 5
Beaunit ROD

Comparison of Total Present Worth Costs for Remedial Alternatives
RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site
Fountain Inn, South Carolina

Alternative		High
Low		Estimate
Estimate		
1	No Action	\$7,417
\$3,461		
2	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions	\$377,622
\$176,151		
3	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-	\$748,625
\$349,159	Soil and Clay Cap	
4	Groundwater Pumping Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-Soil and Clay Cap	\$8,239,948
\$3,845,376		
5	Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade	\$1,370,675
\$243,193		
6	Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring, and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade	\$8,865,058
\$3,740,838		
7	Groundwater, Surface Water, and Sediment Monitoring, and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, and Off-site Disposal of Excavated Material, and Backfill and Grade	\$2,002,775
\$934,429		
8	Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, Off-site Disposal of Excavated Material, and Backfill and Grade	\$9,497,158
\$4,432,074		

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remediation activities will be conducted. This option does, however, include natural attenuation of groundwater and surface soil contaminants. Under this option, organic contaminants in groundwater and surface soil will biodegrade naturally. Metals will tend to persist in sediment and soils. Investigative derived waste (materials from well drilling and soil sampling) from the RI will be disposed and the Site will remain in its current condition. Mid-point of the range of costs for Alternative 1 in present worth is \$5439.

8.5.2 Alternative 2 - Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Deed Restrictions

Alternative 2 combines an institutional control general response action for groundwater and the no action general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the site conditions. Groundwater samples will be collected from six of the monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek); these samples will be analyzed semi-annually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. Based on currently available information, no remedial action will be conducted for groundwater and surface soil. If future monitoring indicates a need for additional remedial action, such action will be considered. This alternative does include natural attenuation and biodegradation of groundwater and surface soil contaminants. Under this alternative, organic contaminants in groundwater and surface soils will degrade naturally. Institutional controls would prevent use of the shallow groundwater and preclude use of the site for new home construction. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. Metals will not biodegrade and will tend to persist in soils. The investigative derived waste from the RI will be disposed and the site area will be maintained in its current condition. Mid-point of the range of present worth estimate costs for Alternative 2 is \$276,887.

8.5.3 Alternative 3 - Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Soil and Clay Cap and Deed Restrictions

Alternative 3 combines the institutional control general response action for groundwater and the containment general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. Groundwater samples will be collected from six of the monitoring wells. Three surface water and sediment sampling locations (from the unnamed creek) will also be sampled. Samples from these locations will be collected and analyzed semi-annually for the first two years and annually for three years thereafter. The results will then be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

The "hot spot" at pipeline location P5 will be excavated and tested by TCLP procedures to insure that the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria. If the "hot spot" soil fails the TCLP procedures and is characterized as hazardous, then the soil will be excavated and sent to a RCRA Class C disposal facility. Assuming the criteria are met, the excavated material will be placed within the fenced area. Initially a 5' by 5' grid will be sampled. The extent of contamination will determine the amount of soil to be excavated. It is believed that 2' of depth will be sufficient with an area 20' by 20' or less. A native soil/clay cap will be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological receptors that may be exposed to the surface soils. The Site will be graded, the lagoon will be backfilled, and 18 inches of clay will first be compacted over the graded surface soils. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. Then 12 inches of native soil will be graded over the clay. The cap will have a maximum

permeability of 1×10^{-5} cm/sec. The natural soil will facilitate grass growth. Grass will provide erosion control. Approximately 5,000 yd³ of clay and 3,000 yd³ of soil will be required for the construction. These materials, at the required thicknesses, will be spread and graded over the entire Site. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. After placement of a natural soil and clay cap, grass will grow on the site and the site will be maintained by cutting the grass and periodically inspecting the cap for damage. An earthen berm, ditch or other drainage control feature will also be constructed to divert surface water away from and around the Site. Therefore, surface water run-off will not cause excessive soil erosion and contaminant transport. Based on the gradient of the Site, drainage controls could be constructed along the southern and southeastern border of the Site. The mid-point of the range of present worth costs for Alternative 3 is \$548,892.

A diagram of Alternative 3 is attached as Figure 13, and a detailed breakdown of the implementation costs for this alternative is attached as Table 6.

8.5.4 Alternative 4 - Groundwater Pumping and Treatment/Grading & Drainage Control-Soil and Clay Cap and Deed Restrictions

Alternative 4 combines the removal and treatment general response action for groundwater and the containment general response action for surface soil. Deed restrictions are also included. Under this alternative, groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, chromium, and manganese a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles,

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Table 6
 Beaunit ROD
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Remedial Technology Cost Estimates - Alternative 3
 RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant

Fountain Inn, south Carolina

Annual Cost		Capital Cost	
High	Item	High	Low
Estimate	Estimate	Estimate	Estimate
Technology			
\$3,750	Grading, Drainage Control	\$225,000	\$105,000
	Soil and Clay Cap (1)		
\$3,750	Total	\$225,000	\$105,000
Technology			
\$90,015	Groundwater and Surface		
	Water Monitoring (Years 1 & 2)		
\$90,015	Total	\$0	\$0
Technology			
\$58,500	Groundwater and Surface		
	Water Monitoring (Years 3 through 5)		
\$58,500	Total	\$0	\$0
Engineering Management (Years 1 & 2)			
\$600	Travel (2)		
\$1,800	Per Diem (3)		
\$9,600	Biannual Report Submittal (4)		
	Well Abandonment	\$1,312	\$613
	Support Plans (H&S, SAP) (5)	\$24,000	\$11,200
	RD Work Plan (6)	\$24,000	\$11,200

Design Plans (7)		\$24,000	\$11,200
Total		\$73,312	\$34,213
\$12,000	\$5,600		

Engineering Management (Years 3 through 5)

Travel (2)			
\$300	\$140		
Per Diem (3)			
\$900	\$420		
Annual Report Submittal (4)			
\$4,800	\$2,240		
Total		\$0	\$0
\$6,000	\$2,800		

Construction Management

Bidding & Contracting (8)		\$15,000	\$7,000
Oversight (9)		\$24,000	\$11,000
Surveying (10)		\$4,500	\$2,100
TOTAL		\$43,500	\$20,100
\$0	\$0		

Present Worth (Years 1 & 2)

Interest Rate	0.05
Number of Years	2
Present Worth Factor = $[(1+i)^n-1] \div i(1+i)^n$	1.86
Present Worth	
\$531,560	\$247,862

Present Worth (Years 3 through 5)

Interest Rate	0.05
Number of Years	3
Present Worth Factor = $[(1+i)^n-1] \div i(1+i)^{(n+2)}$	2.47
Present Worth	
\$159,315	\$74,347

Present Worth of Cap

Maintenance Cost (30 years)	
Interest Rate	0.05
Number of Years	30
Present Worth Factor = $[(1+i)^n-1] \div i(1+i)^n$	15.4
Present Worth	
\$57,750	\$26,950

Total Present Worth

\$748,625	\$349,159
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Low and high estimates based on -30% to +50% variation.

(1) - Annual costs associated with maintenance activities	(6) - 200 man-hrs, \$80/hr =
\$16,000	
will accrue for 30 years.	(7) - 200 man-hrs, \$80/hr =
\$16,000	
(2) - Each trip, 4 days, \$50/day	(8) - Lump Sum, \$10,000
(3) - Each trip, 8 Mandays, \$75/day	(9) - 200 man-hrs, \$80/hr =
\$16000	

(4) - Each report, 40 manhrs/report, \$80/hr
(5) - 200 man-hr, \$80/hr = \$16,000

(10) - Lump Sum, \$3000

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i.e., iron, manganese, and chromium. The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L. The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek. The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units. The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (i.e., removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium VI, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment would not begin until each monitor well is sampled and groundwater samples are analyzed at least one time to confirm the presence of the contaminants of concern (COCs) and their concentrations. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

The "hot spot" at pipeline location P5 will be excavated, tested by TCLP procedures to insure it is not characteristically

hazardous. If the "hot spot" fails TCLP procedures and is characterized as hazardous, then the soil will be excavated and sent to a RCRA Class C disposal facility. Assuming TCLP criteria are met and the soil is not hazardous, then the excavated material will be placed within the fenced area. A

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native soil/clay cap can be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological and human receptors that may be exposed to the surface soils. The Site will be graded, the lagoon will be backfilled, and 18 inches of clay will first be compacted over the graded surface soils. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. Then 12 inches of native soil will be graded over the clay. The cap will have a maximum permeability of 1×10^{-5} cm/sec.

The natural soil will facilitate grass growth. Grass will provide erosion control. Approximately 5,000 yd³ of clay and 3,000 yd³ of soil will be required for the construction. These materials, at the required thicknesses, will be spread and graded over the entire Site. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading at the Site involves the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. With the implementation of a natural soil and clay cap, grass will grow on the site and the site will be maintained by cutting the grass and periodically inspecting the cap for damage.

An earthen berm, ditch, or other drainage feature will be constructed to divert surface water away from and around the Site. Therefore, excessive surface water run-off will be diverted from the Site and not cause surface soil erosion and contaminant transport. Based on the gradient of the Site, drainage control could be constructed along the southern and southeastern border of the Site. Deed restrictions are also a component of Alternative 4. Costs for Alternative 4 in present worth have a mid-point of \$6,042,662.

8.5.5 Alternative 5 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots" and Off-site Disposal and Deed Restrictions

Alternative 5 combines the institutional control general

response action for groundwater and the removal and off-site disposal general response actions for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediments will be implemented to

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provide a method for identifying changes in the Site Conditions. Groundwater samples will be collected from six of the monitoring wells. Three surface water and sediment sampling locations (from the unnamed creek) will also be sampled. Samples from these locations will be collected and analyzed semiannually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. Within the Site, surface soil that contains COC concentrations above cleanup levels will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid. The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals.

A range of costs was developed for this option. The lower range assumes the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations (shown in Figure 3.6 of the Feasibility Study) and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below Remedial Goal Options (RGO's) for surface soil. The total volume of excavation for this scenario is approximately 120 yd³. The higher range costs for this Alternative assumes that all surface soils within the site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd³. Additionally the cost of surface soil sampling and

analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal.

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The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil would pass TCLP criteria and may be accepted for disposal at an off-site solid waste landfill. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 5 substantially.

The excavated areas will be backfilled and graded. The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the excavated areas.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill required, and the amount of grading required following backfill.

The present worth costs of Alternative 5 are estimated to be in the range of \$243,193 to \$1,370,675, with the mid-point of costs for this Alternative as \$806,934.

8.5.6 Alternative 6 - Groundwater Pumping and Treatment/ Excavation of "Hot Spots" and Off-site Disposal and Deed Restrictions

Alternative 6 combines the removal and treatment general response action for groundwater and the removal and disposal general response action for surface soil. Under this alternative groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3-micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles, e.g., iron, manganese, and chromium.) The second

filtration cartridge will be a 0.3-micron filter. This cartridge will remove beryllium to below 4 ug/L.

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The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MWSS will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (for example, removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for Benzene, poly nuclear aromatics (PNA's), beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment will not begin until each monitoring well is sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations. if future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, surface soil that contains COC concentrations above cleanup levels will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft

grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid.

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The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals. A range of cost was developed for this option. The lower range will assume the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below RGOs for surface soil. The total volume of excavation for this scenario is approximately 120 yd³. The higher range units of excavation for removal of "hot spots" assumes that all surface soils within the site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd³. Additionally the cost of surface soil sampling and analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil would pass TCLP criteria and may be accepted for disposal at an off-site solid waste landfill.

If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 6 substantially.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill required, and the amount of grading required following backfill.

Present worth cost estimates for Alternative 6 range from \$3,740,838 to \$8,865,058, with a mid-point cost of \$6,302,948.

8.5.7 Alternative 7 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal

Alternative 7 combines the institutional control general response action for groundwater and a second combined removal

and disposal general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream

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surface water, and stream sediment will be implemented to provide a method of identifying changes in the Site conditions. Groundwater samples will be collected from six of the seven RI monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek). The routines for sampling and analyses will be the same as in Alternative 5. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd³ of surface soil would require excavation. The fill area is approximately 1,800 yd³. The fill extends to an average of approximately 10 ft. Therefore approximately 6,000 yd³ would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria and may be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 7 substantially.

Under Alternative 7, the existing lagoon would be backfilled and the entire site will be graded. The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the site.

The estimated present worth costs for Alternative 7 range from a low of \$934,429 to a high of \$2,002,775, with a mid-point of \$1,468,602.

8.5.8 Alternative 8 - Groundwater Pumping and
Treatment/Excavation of Site Surface Soils and Fill Area and
Off-site Disposal

Alternative 8 combines the removal and treatment general response action for groundwater and a second combined removal and disposal general response action for surface soil. Under this alternative groundwater will be pumped from Monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been initially chosen as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior the filtration system to remove silt or other larger particles, i.e., iron, manganese, and chromium.) The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency. The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and

effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 5 will be initiated. Prior to treatment, each well will be sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd³ of surface soil would require excavation. The Fill area is approximately 1,800 yd³. The fill extends to an average of approximately 10 ft. Therefore approximately 6,000 yd³ would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria and will be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 8 substantially.

Under this alternative the existing lagoon will be backfilled and the entire site will be graded. The grading, work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the site.

The range of present worth costs for Alternative 8 range from a low of \$4,432,074 to \$9,497,158, with a mid-point of \$6,964,616.

9.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP lists nine criteria to serve as the basis for conducting the alternative screening and detailed analysis during the feasibility study, and for subsequently selecting an appropriate remedial action. The evaluation criteria are as follows:

- * Overall protection of human health and the environment
- * Compliance with ARARs
- * Long-term effectiveness and permanence
- * Short-term effectiveness
- * Reduction of toxicity, mobility, and volume through treatment
- * Implementability
- * Cost
- * State Acceptance
- * Community Acceptance

EPA has established criteria for use in comparing the advantages/disadvantages of each alternative. The nine evaluation criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The first two criteria, threshold criteria, are essential and must be met before an alternative is considered further. The next five criteria, primary balancing criteria, are used to further evaluate all options that meet the first two criteria. The final two criteria, modifying criteria, are used to further evaluate EPA's Proposed Plan after public and State comments have been received.

The following discussion compares the various alternatives to the criteria.

9.1 Overall Protection of Human Health and the Environment

This criterion is used to assess whether a remedial alternative provides adequate protection of human health and the environment. The overall assessment takes into account the assessments conducted under all other evaluation criteria, especially long

and short-term effectiveness and compliance with ARARS. The assessment of overall protection should focus on whether an alternative achieves adequate protection, and should describe how site risks are reduced, controlled, or eliminated by the implementation of the alternative.

Relative to groundwater concerns, the alternatives without groundwater pumping and treatment (Alternatives 1,2,3,5,7) will have decreases in the concentrations of organic contaminants through natural attenuation. While metals would tend to persist, migration of metals was not observed during the RI. Alternatives with pump and treatment of groundwater (Alternatives 4,6) would enhance the speed of the reduction of organic contaminants. Groundwater monitoring and use restrictions of all alternatives except the no action alternative would preclude exposure to the groundwater and provide early warning of unacceptable contaminant migration.

Relative to surface soil, alternatives 1 and 2 do not reduce risks to ecological receptors. All other alternatives eliminate risk to area biota.

9.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARS)

This criterion is used to determine whether each remedial alternative complies with ARARS, as defined in CERCLA Section 121 (d).

All non pump and treat alternatives will not immediately meet chemical-specific ARARS including MCLs, but the concentrations of organic contaminants of concern in groundwater will decrease over time (about 5 years) through natural attenuation and will be in compliance with chemical specific ARARS. While metals would tend to persist, monitoring and groundwater use restrictions would prevent exposure and provide warning of contaminant migration, as yet undetected. Groundwater pump and treat alternatives would provide compliance sooner than non pump and treat alternatives.

Relative to action-specific ARARS, Alternatives 3 through 8 comply with requirements of the SC Groundwater Use Act (Title 49, Chapter 5) and the SC Stormwater Management and Sediment Reduction Act (Title 48, Chapter 14) relative to monitoring wells and excavation of surface soils. Alternatives 3 through 8 shall also comply with RCRA as an ARAR with the respective characterization of "hot spot" or surface soils determining whether disposal can be on-site within the fence or off-site at a

Subtitle C or Subtitle D facility. Subtitle C facility disposal would be necessary for any soil characterized as hazardous. Non-hazardous soils could be disposed at a Subtitle D landfill, or moved within the fenced area. No location specific ARARs have been identified for the site.

9.3 Cost

The cost estimates for implementing an alternative are addressed by the following factors:

- * Capital Costs: The direct and indirect capital costs for each remedial alternative are evaluated. Direct capital costs may include construction, equipment, land and site development, buildings and services, and waste disposal costs. Indirect capital cost may include engineering expenses, legal fees, license or permit costs, start-up costs, and contingency allowances.
- * Operation and Maintenance Cost: Operation and maintenance (O&M) costs are post-construction costs necessary to maintain the effectiveness of a remedial action. These costs include raw material costs, maintenance materials and labor costs, operating labor costs, energy, disposal of residues, insurance, taxes, costs of periodic site reviews, and licensing.
- * Present Worth: Present worth analysis allows the evaluation of future expenditures for each remedial alternative relative to a common base year. It is a combination of capital costs and the present worth of operation and maintenance costs over the life of the remedy.

A summary of the present worth cost which includes the capital as well as the operation and maintenance cost for each of the alternatives is presented within the explanation of the alternative.

9.4 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of services and materials for its implementation. The following factors are analyzed by this criterion:

- * Technical feasibility: this factor addresses the difficulties and unknowns associated with the remedial

technologies proposed in each alternative as well as their reliability. Most treatment alternatives will require some level of predesign testing. Bench and pilot-scale testing may be required for technologies that are not proven.

- * Administrative feasibility: this factor addresses the level of agency activity needed to coordinate the implementation of an alternative.
- * Availability of services and materials: this factor addresses the availability of adequate treatment, storage, or disposal facilities, the availability of vendors, and the availability of necessary equipment required for implementing an alternative.

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials. All components of each alternative are both technically and administratively feasible. The design and construction of soil caps is commonly done. Soil excavation and removal would be difficult and require significant administrative requirements, but is commonly done. Necessary technology, services, and materials are all readily available. Pump and treat remedies are commonly installed at Superfund Sites, although due to the long term requirements of these remedies, their effectiveness has not been fully determined at many other sites.

9.5 Short Term Effectiveness

This criterion addresses the effects of each alternative during the construction and implementation phase until the remedial response objectives have been attained. The following factors of this criterion are addressed for each remedial alternative:

- * Potential impacts on the community during implementation of remedial alternatives: this factor addresses risk that results from the implementation of remedial alternatives, such as air pollutant emissions that might affect community health.
- * Potential impacts on workers during implementation of remedial alternatives: this aspect of short-term effectiveness addresses threats that might be posed to workers during the implementation of a remedial alternative, as well as the effectiveness and reliability of protective measures that will be implemented onsite to

mitigate those threats.

- * Potential environmental impacts: this factor addresses the potential adverse effects on the environment resulting from the construction and implementation of an alternative, and the effectiveness and reliability of measures that may be taken to mitigate the adverse effects.
- * Time until protection is achieved: this factor addresses the time required from the time that a technology is chosen until the remedial objectives are met. This factor also includes delays in implementing the technology, as well as the period of time that the technology.

During the implementation of all the alternatives, both onsite workers and people surrounding the site will be protected from possible impacts caused by construction activities. Risks from cap installation or soil excavation and removal would be addressed in health and safety plans. Installation of a cap would be immediately effective in reducing leaching from soils into the groundwater. There is no risk to the environmental receptors from implementation of any remedy, although habitats would be disrupted during installation activities. Community risks from construction truck traffic would be short term and safety could be insured by additional signage and traffic control.

9.6 Long-Term Effectiveness and Permanence

This criterion addresses the extent of residual risk at the Site after the remedial objectives have been met. In addition, this criterion will address whether conditions that pose unacceptable risks may reoccur at some point after the remediation is complete. The following factors are addressed by this criterion:

- * Permanence: this factor addresses the permanence of remedies for the Site.
- * Magnitude of total residual risk: this factor assesses the long-term risk associated with exposure to treatment residuals and untreated residual contamination.
- * Adequacy and reliability of controls: this factor addresses the type and degree of long-term management, monitoring, and operation and maintenance functions that must be performed. This factor also addresses the ability of technologies to meet the required process efficiencies or

performance specifications.

- * Need for periodic review: this factor addresses the adequacy and suitability of controls, if any, that are used to manage treatment residuals or untreated wastes that remain on-site. It includes the assessment of potential exposure and the associated risks should the remedial action need replacement.
- * Certainty of Success: this factor addresses the level of confidence for the chosen technologies to meet the remedial criteria.

All of the alternatives under consideration by EPA in this Record of Decision were evaluated for this criteria under each of its components consisting of 1) permanence, 2) magnitude of residual risk, 3) adequacy and reliability of controls, 4) need for periodic review, and 5) certainty of success. Relative to permanence and magnitude of residual risk, Alternatives 1,2,3,5, and 7 only reduce risk in groundwater after natural attenuation processes are complete. Pump and treat Alternatives 4,6, & 8 will reduce risks from groundwater more quickly. Alternatives 1 and 2 do not reduce ecological risks while all other alternatives do. Adequacy and reliability of controls for all alternatives is generally good with the proviso that institutional controls in Alternative 2 are dependent on tight governmental control. All alternatives involving regular monitoring will require periodic review as will alternatives involving capping the site. Alternatives involving excavation and soil replacement will not require periodic review. All alternatives have approximately the same certainty of success with the pump and treat alternatives having the ability to meet Remedial Action Objectives more quickly.

9.7 Reduction of Toxicity, Mobility, and Volume

This criterion addresses the preference stated in CERCLA Section 121 that remedial alternatives be selected which employ technologies that permanently and significantly reduce the toxicity, mobility, or volume of contaminants. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. The following specific factors are taken into consideration:

- * Treatment or recycling processes;

- * Reduction of toxicity, mobility and volume of potential contaminants of concern in each medium of concern; and
- * Degree to which treatment is irreversible.

This criteria was evaluated foreach of its components consisting of 1) treatment used, 2) reduction of toxicity, mobility, or volume, 3) type and quantity of residuals remaining after treatment, and 4) irreversibility of treatment. Only pump and treat alternatives involve treatment and are considered irreversible. Such treatment will generate residuals which will require off-site disposal Alternatives involving soil excavation and removal will reduce the toxicity, mobility, and volume by removal of the contaminated soils. Capping alternatives will reduce the mobility of the contaminants, while soil excavation remedies are considered irreversible.

9.8 State Acceptance

The State of South Carolina's Department of Health and Environmental Control was consulted during the drafting of both the Proposed Plan and this Record of Decision. SCDHEC has concurred with this Record of Decision. A copy of the State Concurrence letter is attached as Appendix A.

9.9 Community Acceptance

The purpose of this Record of Decision and the upcoming comment period is to encourage input from the public during the remedy selection process. No adverse comments were received during the public comment period to the then-Proposed Plan for the Site. The few comments that were received are contained with an Agency response in the Responsiveness Summary attached to this document as Appendix B.

10.0 SELECTED REMEDY

10.1 Preferred Alternative Summary

In summary, based on all information available at this time, EPA has selected and supports a modification to Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-Soil and Clay Cap and Deed Restrictions, as the selected remedy for the

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Beaunit Site. The only modification to Alternative 3 as described earlier in this Record of Decision and within the

Feasibility Study is the design specifications for the Cap. Both EPA and SCDHEC concur that the cap should be designed to meet a specification of 10⁻⁹ permeability, rather than the 10⁻⁵ permeability contained in the alternative as developed in the Feasibility Study. The change was based on modeling the site with the Summers model, commonly used to predict effectiveness in caps to prevent leaching from soils of contaminants. EPA and SCDHEC feel the higher degree of impermeability of a cap built to 10⁻⁹ specifications would insure that the RGO's would be met in the groundwater. The exact details of the construction of the cap will be determined during the Remedial Design. Several assumptions were made during EPA/SCDHEC change in design specifications for the cap. Utilizing cost comparisons to other recent 10⁻⁹ cap designs for sites in this area capital costs are estimated to be \$32,000 additional for the site remedy. Several modeling runs of caps that could achieve 10⁻⁹ were performed on RACER software. (Remedial Action Cost Engineering and Requirements System, Dept. of Air Force, 1993). From those efforts, it is believed that the capital cost of the Modified Alternative 3 site cap would be between \$212,000 to \$220,000, below the \$225,000 high range of the Feasibility Study estimate of capital costs for the 10⁻⁹ cap. EPA believes that a conservative estimate of the total costs for the Selected Remedy, the modified Alternative 3 is \$580,882. This alternative represents the best balance among the criteria used to evaluate remedies. Under this selected remedy a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method of identifying changes in the Site conditions. Groundwater samples will be collected from six of the seven RI monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek). Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. The modified Alternative 3 is believed to be protective of human health and the environment, would attain ARARs, would be cost effective, and would utilize permanent solutions and alternative treatment technologies or resource technologies to the maximum extent practicable.

Alternatives 1 and 2, i.e., no action and institutional controls, do not specifically address the risks to potential ecological receptors. Alternatives 3 through 8 would achieve

the RAOs for the Site. Alternative 3 would achieve the RAOs for the Site more cost effectively than Alternatives 4 through 8.

10.2 Applicable or Relevant and Appropriate Requirements (ARARs)

ARARs originate from applicable requirements, intended to definitely and specifically apply to a remedial action; or relevant and appropriate requirements, which, while not intended to apply to the specific situation in question, EPA judges to be applicable to a remedial action. In addition, when establishing criteria for ensuring the proper implementation of a remedial action, EPA may develop requirements from other guidance documents and criteria, sources often referred to as "To Be Considered" material (TBC). Attached Tables 7, 8, 9, 10 and 11 summarize potential ARARs, both Federal and State. Table 12 lists "To Be Considered" material.

10.2.1 Applicable Requirements

Soil remediation shall comply with all applicable portions of the following Federal and State of South Carolina regulations:

49 CFR Parts 107, 171-179, promulgated under the authority of the Hazardous Materials Transportation Act. Regulates the labelling, packaging, placarding, and transport of hazardous materials off-Site.

40 CFR Parts 261, 262 (Subparts A-D), 263, and 268, promulgated under the authority of the Resource Conservation and Recovery Act. These regulations govern the identification, transportation, manifestation, and land disposal restriction requirements of hazardous wastes. If the contaminated soils fail TCLP, most likely, the land disposal restrictions in 40 CFR Part 268 will apply. In the event that the Site soils requiring remediation do not test hazardous (i.e., do not fail TCLP), the regulations listed here will be considered relevant and appropriate rather than applicable.

SCKWMR 61-79.124, 79.261, 79.262, 79.263 and 79.268, South Carolina Hazardous Waste Management Regulations, promulgated pursuant to the Hazardous Waste Management Act, SC Code of Laws, 1976, as amended, establishes criteria for identifying and

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handling hazardous wastes, as well as land disposal restrictions. These regulations also will become relevant and appropriate in the event that the soils requiring remediation do not prove to be hazardous, as described in the above paragraph.

10.2.2 Relevant and Appropriate Requirements

The following regulations are "relevant and appropriate" to source control actions (soil remediation) at the Site. Applicability of these air quality control regulations is due to the potential for release of harmful particulates (metals) or VOCs during soil excavation and handling activities.

40 CFR Parts 60 and 61, 42 U.S.C. 7401 et. seq. promulgated under the authority of the Clean Air Act. Included are the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Ambient air quality standards and standards for emissions to the atmosphere fall under these regulations.

SC Reg. 61-62, South Carolina Air Pollution Control Regulations and Standards, promulgated pursuant to the S.C. Pollution Control Act, SC Code of Laws, 1976, as amended. Establishes limits for emissions of hazardous air pollutants and particulate matter, and establishes acceptable ambient air quality standards within South Carolina.

10.2.3 "To Be Considered" and Other Guidance

Revised Procedures for Planning and Implementing Off-Site Response Actions, OSWER Directive 9834.11, November 1987. This directive, often referred to as "the off-Site policy," requires EPA personnel to take certain measures before CERCLA wastes are sent to any facility for treatment, storage, or disposal. EPA personnel must verify that the facility to be used is operating in compliance with Sections 3004 and 3005 of RCRA, 42 U.S.C. 6924 and 6925, as well as all other federal and state regulations and requirements. Also, the permit under which the facility operates must be checked to ensure that it authorizes (1) the acceptance of the type of wastes to be sent, and (2) the type of treatment to be performed on the wastes.

40 CFR Part 50, promulgated under the authority of the Clean Air Act. This regulation includes the National Ambient Air Quality Standards (NAAQS), and establishes a national baseline of ambient air quality levels. The state regulation which implements this regulation, South Carolina Reg. 62-61, is

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Table 7

Beaunit ROD

Chemical-Specific ARARs		Federal	
Circular Knit And Dyeing Plant Site		RI/FS Of Beaunit Corp.	
South Carolina		Fountain Inn,	
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation		Citation	
Description	Appropriate		Comment
RESOURCE CONSERVATION AND RECOVERY ACT		42 USC 6901	
RCRA ARARs may be applicable Identification and Listing that are subject to of Hazardous Waste wastes under	No	40 CFR 261 should "hot spot" soils Subparts C and D TCLP procedures and are	Defines those solid wastes fail and regulated as hazardous 40 CFR 124, 262-265, 268, 270,
AND 271		characterized as hazardous	
RCRA Maximum Concentration constituents as Limits protection standards	No	40 CFR 264.94 See above.	Standards for 14 hazardous a part of RCRA groundwater
Treatment Standards hazardous wastes before land	No	40 CFR 268 See above. Subpart D	Treatment standards for or hazardous waste extracts disposal is allowed
SAFE DRINKING WATER ACT		42 USC 300	
SDWA Maximum Contaminant compounds, minerals, Limits (MCL) standards for	Yes	40 CFR 141 and 143 MCLs are relevant and appropriate for a Class IIB groundwater designation	Standards for select organic or metals that are enforceable public drinking water systems
CLEAN WATER ACT		33 USC 1251-1376	
Ambient Water for the protection Quality Criteria life larger water systems	Yes	(presented in CERCLA Some possible alternatives Compliance...Manual treatment residues into a drainage body which lead to	Suggested ambient standards involve discharge of of human health and aquatic lead to

Toxic Pollutant or prohibitions Effluent Standards aldrin/dieldrin, benzidine, PCBs	No	40 CFR 129 These pollutants have not been identified as chemicals of concern at the Site	Establishes effluent standards for certain toxic pollutants: DDT, endrin, toxaphene,
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Table 7 (cont.)

Beaunit ROD

Chemical-Specific ARARs	Federal
Circular Knit And Dyeing Plant Site	RI/FS Of Beaunit Corp.
South Carolina	Fountain Inn,

Applicable/
Standard, Requirement,
Relevant and
Criteria, or Limitation

Description	Appropriate	Citation	Comment
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CLEAN AIR ACT		42 USC 1857-18571	
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National Emission constituents from Standards for Hazardous Air Pollutants	No	40 CFR 61 Air stripping was removed as an option.	Standasds for specific specific point sources
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FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT		7 USC 136	
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Pesticide Registration and regulated under FIFRA Classification Procedures	No	40 CFR 152	Defines those substances as pesticides
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Tolerances and exemptions of residual pesticides, from Tolerances for Pesticide and animal commodities	No	40 CFR 180	Sets allowable concentrations including dicamba, in plant
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Table 8

Beaunit ROD

Chemical-Specific ARARs			Federal
Circular Knit And Dyeing Plant Site			RI/FS Of Beaunit Corp.
South Carolina			Fountain Inn,
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation		Citation	
Description	Appropriate		Comment
SOUTH CAROLINA NPDES PERMIT REGULATIONS		Title 61 Chapter 9	
Toxic Pollutant Effluent Standards or prohibitions for	Yes	Regulation 61-9.129 The substantive requirements	Establishes effluent standards of the SC NPDES toxic pollutants.
Regulations may be relevant and appropriate			
during Site remediation because some			
alternatives will entail discharge of treated			
effluent from a groundwater pump and treat			
system.			
SOUTH CAROLINA SAFE DRINKING WATER REGULATIONS		Chapter 61	
Maximum Contaminant Levels in concentration of Drinking Water drinking water.	Yes	Regulation 58.5 May be applicable because benzene, beryllium and manganese were	Establishes the maximum contaminants allowed in
detected in groundwater samples			

at concentrations greater than
their respective State drinking
water standards

SOUTH CAROLINA WATER CLASSIFICATION STANDARDS		Chapter 61	
General rules and standards contaminant levels for all applicable to all waters	Yes	Regulation 68 Section E	State standards that set state waters.
Class descriptions and specific system and applicable standards for surface waters standards.	Yes	Regulation 68 Section F	State class identification surface water quality
Class descriptions and specific system and applicable standards for groundwaters	Yes	Regulation 68 Section G	State class identification groundwater quality standards.

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Table 8 (cont.)

Beaunit ROD

Chemical-Specific ARARs	Federal
Circular Knit And Dyeing Plant Site	RI/FS Of Beaunit Corp.
South Carolina	Fountain Inn,

Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation	Citation	
Description	Appropriate	Comment
Classified Waters applicable streams in Branch which is a classified water.	Yes	Regulation 69 An unnamed creek discharges to Howards Criteria and class listing for the State of South Carolina.

SOUTH CAROLINA Chapter 61

HAZARDOUS WASTE
MANAGEMENT REGULATIONS

Groundwater Protection: limits in the groundwater Concentration Limits	Yes	Regulation 61-79.264 Subpart F Section 264.94	Establishes concentration for hazardous constituenu.
SOUTH CAROLINA AMBIENT AIR QUALITY CONTROL ACT		Regulation 61-62.5	
Ambient Air Quality Standards quality standards and dioxide, total carbon monoxide, nitrogen dioxide, and lead.	No	Standard No. 2	Establishes ambient air analytical mclbods for sulfur suspended particulates, PM10, ozone, gaseous fluorides,
Toxic Air Pollutants: air concentrations for Toxic Air Emissions	No	Standard No. 8 Section II	Establishes allowable ambient toxic air pollutants.

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Table 9			
Beaunit ROD			
Chemical-Specific ARARs			Federal
Circular Knit And Dyeing Plant Site			RI/FS Of Beaunit Corp.
South Carolina			Fountain Inn,
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation		Citation	
Description	Appropriate		Comment
RESOURCE CONSERVATION AND RECOVERY ACT		42 USC 6901-6987	
Guidelines for the Thermal Processing		40 CFR 240	Establishes guidelines

applicable to thermal of Solid Wastes facilities designed to municipal solid wastes	No		processing (incineration) process 50 tons or more of
Guidelines for the Land Disposal of applicable to land Solid Wastes nonhazardous solid access, design, and	No	40 CFR 241	Establishes minimum guidelines disposal facilities receiving wastes, including siting, operating conditions
Guidelines for the Storage and collection of Collection of Residential, Commercial, institutional solid and Institutional Solid waste on the types of frequency	No	40 CFR 243	Establishes guidelines for the residential, commercial, and wastes, including guidelines containers and collection
Criteria for Classification of Solid in determining which Waste Disposal Facilities and Practices facilities and practices pose a adverse effects on health or	No	40 CFR 257	Establishes criteria for use solid waste disposal reasonable probability of the environment
Criteria for Municipal Solid Waste criteria for municipal Landfills ensure protection of human including siting corrective action, and post-	No	40 CFR 258	Establishes minimum national solid waste landfills to health and the environment, restrictions, monitoring, closure care
Hazardous Waste Management criteria for modification Systems General in 40 CFR 260-26.5	No	40 CFR 260	Establishes procedures and or revocation of any provision
Standards Applicable to Generation of generators of hazardous Hazardous Waste	No	40 CFR 262	Establishes standards for waste
Standards Applicable to Transporters apply to persons of Hazardous Waste within the U.S. if the	No	40 CFR 263	Establishes standards which transporting hazardous waste

manifest under 40 CFR

transportation requires a
262.

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Beaunit Circular Knit & Dyeing NPL Site
Page 71

Table 9 (cont.)

Beaunit ROD

Chemical-Specific ARARs

Federal

RI/FS Of Beaunit Corp.

Circular Knit And Dyeing Plant Site

Fountain Inn,

South Carolina

Applicable/

Standard, Requirement,
Relevant and
Criteria, or Limitation

Citation

Description

Appropriate

Comment

Standards for Owners and Operation of
standards which No
Hazardous Waste Treatment, Storage,
management of hazardous
and Disposal Facilities
of facilities which

40 CFR 264

Establishes minimum national
define the acceptable
waste for owners and operators
treat, store, or dispose of

hazardous waste

General Facility Standards

Subpart

Preparedness and Prevention

Subpart

No

Contingency Plan and Emergency

Subpart

No

Procedures

Manifest System Record-keeping,
and Reporting

Subpart

No

Releases from Solid Waste

Subpart

No

	Management Units	
No	Closure and Post-closure	Subpart
No	Financial Requirements	Subpart
No	Use and Management of Containers	Subpart
No	Tanks	Subpart
No	Surface Impoundments	Subpart
No	Waste Piles	Subpart
No	Land Treatment	Subpart
No	Landfills	Subpart
No	Incinerators	Subpart
No	Miscellaneous Units	Subpart

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Beaunit Circular Knit & Dyeing NPL Site
Page 72

Table 9 (cont.)

Beaunit ROD

Chemical-Specific ARARs

Circular Knit And Dyeing Plant Site
South Carolina

Applicable/
Standard, Requirement,

Federal
RI/FS Of Beaunit Corp.
Fountain Inn,

Relevant and Criteria, or Limitation Description	Citation Appropriate	Comment
Interim Standards for Owners and standards that define No Operators of Hazardous Waste hazardous waste during Treatment, Storage, and Disposal and until certification of Facilities facility is subject to post-post-closure CERCLA's goal of long-term protection of human health and the environment	40 CFR 265 Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with	Established minimum national acceptable management of the period of interim status final closure or, if the closure requirements, until responsibilities are fulfilled
Standards for the management of apply to recyclable No Specific Hazardous Wastes and recover economically Specific Types of Hazardous Waste precious metals, including Management Facilities	40 CFR 266	Establishes requirements which material that are reclaimed to significant amounts of gold and silver
Interim Standards for owners and standards that define No Operators of New Hazardous Land hazardous waste for new disposal Facilities standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of human health and the environment	40 CFR 267 Remedies should be consistent with the more stringent Part 264	Establishes minimum national acceptable management of land disposal facilities
Land Disposal restriction of burial of No	40 CFR 268	Establishes a timetable for wastes and hazardous materials
Hazardous Waste Permit Program basic EPA No CERCLA reponse action.	40 CFR 270 A permit is not required for	Establishes provision covering on-site permitting requirements

Substantive requirements are addressed in 40 CFR 264

Underground Storage Tanks related to underground	No	40 CFR 280	Establishes regulations storage tanks
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Record of Decision
Beaunit Circular Knit & Dyeing NPL Site
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Table 9 (cont.)

Beaunit ROD

Chemical-Specific ARARs	Federal
Circular Knit And Dyeing Plant Site	RI/FS Of Beaunit Corp.
South Carolina	Fountain Inn,

Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation Description	Appropriate	Citation	Comment
SAFE DRINKING WATER ACT		40 USC 300	
National Primary Drinking Water analytical, and moniloring Regulations	No	40 CFR 141	Specifies sampling, requirements
Underground Injection Control underground sources of Regulations	No	40 CFR 144-147	Provides for protection of drinking water
CLEAN WATER ACT		33 USC 1251-1376	
National Pollutant Discharge discharge of pollutants Elimination System waters of the United	Yes	40 CFR 125 A permit is not required for on-site CERCLA response anlions,	Requires permits for the from any point source into States.
substantive requirements would apply			

National Pretreatment Standards pollutants which pass	No	40 CFR Part 403	Sets standards to control
treatment processes in			through or interfere with
or which may			publicly owned treatment works
			contaminate sewage sludge
CLEAN AIR ACT		42 USC 1857-18571	
Standards of Performance for		40 CFR 60	Sets performance standards and
test methods for	No	Subpart E	evaluation of performance
incinerators			
National Emission Standards for		40 CFR 61	Stipulates monitoring
requirements for emissions of	No		specific contaminants
Hazardous Air Pollutants			
OCCUPATIONAL SAFETY AND		29 USC 651-678	Regulates worker health and
safety	Yes	Under 40 CFR 300,150,	
HEALTH ACT			
requirements of the Act apply to all			
response activities under the NCP			

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Beaunit Circular Knit & Dyeing NPL Site
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Table 9 (cont.)

Beaunit ROD

Chemical-Specific ARARs

Circular Knit And Dyeing Plant Site

South Carolina

Federal

RI/FS Of Beaunit Corp.

Fountain Inn,

Applicable/

Standard, Requirement,
Relevant and
Criteria, or Limitation
Description

Appropriate

Citation

Comment

HAZARDOUS MATERIALS
TRANSPORTATION ACT

40 USC 1801-1813

Hazardous Materials Transportation hazardous materials Yes Regulations transportation of contaminated soils or fill materials from the Site to an off-site landfill. Alternatives 5 through 8 include the off-site disposal option.	49 CFR 107, 171-177 May be relevant and appropriate for	Regulates transportation of
FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT	7 USC 136	
Regulation for the Acceptance of pesticides and No Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticides Containers	40 CFR 165	Recommended procedures for pesticides containers disposal
Record of Decision Beaunit Circular Knit & Dyeing NPL Site Page 75		
Table 10 Beaunit ROD		
Chemical-Specific ARARs Circular Knit And Dyeing Plant Site South Carolina		Federal RI/FS Of Beaunit Corp. Fountain Inn,
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation	Citation	
Description	Appropriate	Comment
SOUTH CAROLINA POLLUTION CONTROL ACT	Title 48 Chapter 1 Section 48-1-100	Permits for discharge of water

or air contaminants; Yes Substantive requirements may be relevant and jurisdiction of Department.
appropriate during Site remediation because some
alternatives will entail discharge of treated effluent from
a groundwater pump and treat system.

construction or alteration of	No	Section 48-1-110	Permits required for disposal system; or discharges
classification; unlawful operation			
SOUTH CAROLINA followed to obtain a	Yes	Title 49 Relevant and appropriate for institutional controls such as abandonment of monitoring wells.	Establishes procedures to be permits to withdraw, obtain, for the submission of amount of groundwater and proposed aquifers.
GROUNDWATER USE ACT or use groundwater and information concerning the withdrawal, its intended use,		Chapter 5	
SOUTH CAROLINA acceptable management	Yes	Title 48 May be relevant and appropriate during Site remediation of stormwater and sediments because some alternatives entail actions that will activities.	Establishes criteria for the
STORMWATER MANAGEMENT during land disturbing disturb		Chapter 14	
AND SEDIMENT REDUCTION land surface, e.g., excavation of surface soils.			
SOUTH CAROLINA NPDES standards and permitting	Yes	Title 61 NPDES permitting is not required at CERCLA sites; requirements.	Establishes treatment
PERMIT REGULATIONS however, substantive requirements may be relevant and appropriate during site remediation.		Chapter 9	
SOUTH CAROLINA SAFE standards to ensure the	Yes	Chapter 61 May be relevant and appropriate.	Establishes criteria and safety of public water
DRINKING WATER supplies.			
REGULATIONS			

Beaunit ROD

Federal

Chemical-Specific ARARs

RI/FS Of Beaunit Corp.

Circular Knit And Dyeing Plant Site

Fountain Inn,

South Carolina

Applicable/

Standard, Requirement,

Relevant and

Criteria, or Limitation

Citation

Description

Appropriate

Comment

SOUTH CAROLINA

acceptable

Yes

Chapter 72

May be relevant and appropriate during Site

STORMWATER MANAGEMENT

sediments during

remediation.

Establishes standards for the

management of stormwater and

REGULATIONS

land disturbing activities.

SOUTH CAROLINA SOLID

WASTE MANAGEMENT ACT

Title 44

Chapter 96

Approval procedures for special
delineates the minimum

No

Section 44-96-390

Defines special wastes and

wastes.

requirements for the waste

analysis plan and

approval procedures for the

disposal of special

wastes.

SOUTH CAROLINA

standards which define

No

Chapter 61

Establishes minimum state

HAZARDOUS WASTE

Regulations 79.124-

theacceptable management of

hazardous wastes for

79.270

owners and operators of

REGULATION

facilities which treat, store,

dispose of hazardous wastes.

SOUTH CAROLINA AMBIENT

AIR QUALITY CONTROL ACT

Regulation 61-62.5

Toxic Air Pollutants: Controls
reduce emissions by

No

Standard No. 8

A source will be required to

altering the process, or

This standard is not an ARAR because the activities

Section III

implementing controls,

a

proposed for the Site do not meet the definition of

limiting production if site-

specific modeling

source.

indicates that maximum

allowable concentrations

are exceeded.

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 Beaunit Circular Knit & Dyeing NPL Site
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Table 10

Beaunit ROD

Chemical-Specific ARARs			Federal
Circular Knit And Dyeing Plant Site			RI/FS Of Beaunit Corp.
South Carolina			Fountain Inn,
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation	Citation		
Description	Appropriate		Comment
SOUTH CAROLINA POLLUTION CONTROL ACT	Title 48 Chapter 1		
or air contaminants;	Yes	Section 48-1-100 Substantive requirements may	Permits for discharge of water be relevant and jurisdiction of Department
appropriate during Site remediation because some			
alternatives will entail discharge of treated effluent from			
a groundwater pump and treat system.			
construction or alternation of	No	Section 48-1-110	Permits required for
classification; unlawful operation			disposal systems; or discharges
SOUTH CAROLINA followed to obtain a	Yes	Title 49 Relevant and appropriate for	Establishes procedures to be for institutional controls such
GROUNDWATER USE ACT		Chapter 5	permit to withdraw, obtain, or
use groundwater and		as abandonment of monitoring	wells. for the submission of
information concerning the			amount of groundwater
withdrawal, its intended use,			and proposed aquifers.

SOUTH CAROLINA acceptable management STORMWATER MANAGEMENT during land disturbing disturb AND SEDIMENT REDUCTION land surface, e.g., excavation of surface soils. ACT	Yes	Title 48 May be relevant and appropriate during Site remediation Chapter 14 because some alternatives entail actions that will	Establishes criteria for the of stormwater and sediments activities.
SOUTH CAROLINA NPDES standards and permitting PERMIT REGULATIONS however, substantive requirements may be relevant and appropriate during site remediation.	Yes	Title 61 NPDES permitting is not required at CERCLA sites; Chapter 9 requirements.	
SOUTH CAROLINA SAFE standards to ensure the DRINKING WATER supplies. REGULATIONS	Yes	Chapter 61 May be relevant and appropriate.	Establishes criteria and safety of public water

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Beaunit Circular Knit & Dyeing NPL Site
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Table 10 (cont.)

Beaunit ROD

Chemical-Specific ARARs			Federal
Circular Knit And Dyeing Plant Site			RI/FS Of Beaunit Corp.
South Carolina			Fountain Inn,
Applicable/ Standard, Requirement, Relevant and Criteria, or Limitation Description		Citation Appropriate	Comment
SOUTH CAROLINA acceptable STORMWATER MANAGEMENT sediments during REGULATIONS	Yes	Chapter 71 May be relevant and appropriate during Site remediation.	Establishes standards for the management of stormwater and land disturbing activities.
SOUTH CAROLINA SOLID		Title 44	

WASTE MANAGEMENT ACT		Chapter 96	
Approval procedures for special delineates the minimum wastes. analysis plan and disposal of special	No	Section 44-96-390	Defines special wastes and requirements for the waste approval procedures for the wastes.
SOUTH CAROLINA standards which define HAZARDOUS WASTE REGULATION facilities which treat, store,	No	Chapter 61 Regulations 79-124-79.270	Establishes minimum state the acceptable management of owners and operators of dispose of hazardous wastes.
SOUTH CAROLINA AMBIENT AIR QUALITY CONTROL ACT		Regulation 61-62.5	
Toxic Air Pollutants: Controls reduce emissions by altering the process, or a specific modeling allowable concentrations	No	Standard No. 8 This standard is not an ARAR because the activities Section III proposed for the Site do not meet the definition of source.	A source will be required to implementing controls, limiting production if site-indicates that maximum are exceeded.

Criteria, or Limitation Description		Citation Appropriate	Comment
NATIONAL HISTORIC take into account the PRESERVATION ACT assisted undertaking or building, structure, or eligible for inclusion in Historic Places.	No	16 USC 470 No alternative affect any structure or object listed on or eligible for the 40 CFR 6.301(b) National Register. 36 CFR 800	Requires federal agencies to district, site, building, effect of any federally licensed on any district site object that is included in or the National Register of
ARCHEOLOGICAL AND provide for preservation of data. HISTORIC PRESERVATION ACT data which might be of terrain as a result of a or a federally licensed	No	16 USC 469 No alternatives affect	Establishes procedures to historical or archeological historical and archeological destroyed through alteration federal construction project activity or program.
HISTORIC SITES, BUILDINGS, consider the existence AND ANTIQUITIES ACT the National Registry of undesirable impacts on	No	16 USC 461-467 No alternatives affect any	Requires federal agencies to National Landmark. and location of landmarks on National Landmarks to avoid such landmarks.
FISH AND WILDLIFE federally permitted or COORDINATION ACT proposes or authorizes or ether water body protection of fish and	No	16 USC 661-666 No modification to a stream proposed.	Requires consultation when a or water body is licensed department or agency any modification of any stream and adequate provision for wildlife resources.
ENDANGERED SPECIES ACT endangered species which endangered species consultation with Department of on the site or within « mile of the site.	No	16 USC 1531 No known resident population or designated critical 50 CFR 200 habitats for any state or endangered species were identified as occurring	Requires action to conserve within critical habitats on federally listed threatened or depend and includes Interior.
CLEAN WATER ACT		33 USC	

Dredge or Fill Requirements of dredged or fill (Section 404) waters.	No	40 CFR 230, 231 There will be no discharge of dredged or fill material into a navigable waters as part of any alternative.	Requires permits for discharge material into navigable
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Table 12 Beaunit ROD	Guidelines To Be Considcred RI/FS of Beaunit Corp. Circular Knit And Dyeing Plant Site Fountain Inn, South Carolina
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Federal Criteria, Advisories, and Procedures

- | | |
|---|--|
| Health
Washington,
levels
health
advisories.
hazardous under
Federation | <ol style="list-style-type: none"> 1. Integrated Risk Information System (IRIS) Chemical Files, USEPA, Office of and Environmental Assessment, Office of Research and Development, D.C. 20460. 2. Drinking Water Equivalent Levels (DWELs), medium-specific drinking water derived from RfDs, USEPA Health Advisories, Office of Drinking Water, 1987. 3. Maximum Contaminant Level Goals, Safe Drinking Water Act (SDWA), 40 CFR 141, and Federal Recommended Maximum Concentration Limits (RMCLs). 4. Federal Water Quality Criteria (FWQC) for evaluating toxic effects on human and aquatic organisms. 5. Toxic Substances and Control Act (TSCA) health data and chemical 6. Public health criteria on which the decision, to list pollutants as Section 112 of the Clean Air Act, was based. 7. Health Advisories, non enforceable contaminant limits derived from DWELs, published by USEPA, Office of Drinking Water. 8. Advisories of the Fish and Wildlife Service and the National Wildlife under the Fish and Wildlife Coordination Act. 9. TSCA Compliance Program Policy, "TSCA Enforcement Guidance Manual - Policy Compendium," USEPA Office of Enforcement and Compliance Monitoring, 1985. 10. Guidelines for Groundwater Classification under the EPA Groundwater |
|---|--|

Protection

Strategy.

6,

11. Executive Order related to Wetlands (11990) as implemented by EPA's August 1985 Policy on Floodplain and Wetlands Assessments for CERCLA.

USEPA RCRA Design Guidelines

12. Design Guidelines for Surface Impoundments, Liners Systems, Final Cover and Freeboard Control (1987).

Technical Resource Documents

13. Evaluating Cover Systems for Solid and Hazardous Waste (1982).
14. Soil Properties, Classification, and Hydraulic Conductivity Testing (1984).

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Beaunit Circular Knit & Dyeing NPL Site
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Table 12 (cont.)
Beaunit ROD

Guidelines To Be Considered
RI/FS of Beaunit Corp. Circular Knit And Dyeing Plant Site
Fountain Inn, South Carolina

Test Methods for Evaluatinn Solid Waste

15. Solid Waste Leaching Procedure Manual (1984).
16. Methods for the Prediction of Leachate Plume Migration and Mixing.
17. Test Methods for Evaluating Solid Wastes, USEPA Office of Research and Development, third edition (1986) SW-846.
18. Lab protocols developed pursuant to the Clean Water Act, Section 304(h).

USEPA Office of Water Guidance Documents

Pretreatment Guidance Document

19. Section 304(g) Guidance Document: Revised Pretreatment Guidelines, Volumes II, III.

Water Quality Guidance Documents

20. Technical Support Manual: Waterbody Surveys and Assessments for Conduction Use Attainability Analyses (1983).

I,

21. Technical Support Document for Water Quality-Based Toxics Control.
22. Water-Related Environmental Fate of 129 Priority Pollutants (1979).
23. The Water Quality Control (WQC) Standards Handbook (1983).

Water Quality Guidance Documents (continued)

24. USEPA Water Quality Advisories, EPA Office of Water, Criteria and Standards Division.

NPDES Guidance Documents

25. NPDES Best Management Practices Guidance Manual (June 1981).
26. Case studies on toxicity reduction evaluation (May 1983).

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Beaunit Circular Knit & Dyeing NPL Site
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applicable to the source control portion of the remedy.

Various TBC materials were utilized in the Baseline Risk Assessment and in the Feasibility Study. Because cleanup standards were established based on these documents, they are considered TBC.

In the Baseline Risk Assessment, TBC material included information concerning toxicity of, and exposure to, Site contaminants. TBC material included the Integrated Risk Information System (IRIS), Health Effects Assessment Summary Tables (HEAST), and other EPA guidance as specified in the Baseline Risk Assessment.

In the FS, soil concentrations protective of human health and the environment were calculated based on the Site-specific risk calculations from the Baseline Risk Assessment, using TBC information as described above. There are no established federal or state standards for acceptable levels of Beaunit Site contaminants in surface or subsurface soils or sediments.

For soils/sediments, the leachate-based and health-based models were both considered. In order to be most protective, the lower of the two was targeted. The chemical-specific goals produced through the leachate-based model were found to be lower, except for vinyl chloride. Due to the conservative nature of the health-based and the leachate models, certain chemical-specific cleanup goals were calculated below respective method detection limits and MCL values.

10.2.4 Other Requirements

Remedial design often includes the discovery and use of unforeseeable but necessary requirements which result from the planning and investigation inherent in the design process itself. Therefore, during design of the source control component of the selected remedy, EPA may, through a formal ROD modification process such as an Explanation of Significant Differences or a ROD Amendment, elect to designate further ARARs which apply, or are relevant and appropriate, to this portion of the remedy.

10.3 Performance Standards

The standards outlined in this section comprise the performance standards defining successful implementation of this portion of the remedy.

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Beaunit Circular Knit & Dyeing NPL Site
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Excavation. The soil remediation goals (Table 3) are established as performance standards. The performance standards shall control the excavation procedure described above. Additionally, all on-Site excavation work shall comply with 29 CFR 1910.120, the OSHA health and safety requirements applicable to remedial activities. Transport of contaminated soil. Transportation shall be accomplished in compliance with the Hazardous Materials Transportation Act (49 CFR 107, 171-179).

Disposal of contaminated soil. Disposal of contaminated Site soil shall comply with the applicable, or relevant and appropriate, RCRA regulations (40 CFR Parts 261, 262 (Subparts A-D), 263, and 268). The potential disposal of characteristically hazardous soils (as determined by TCLP procedures) shall be done at a RCRA Subtitle C treatment, storage, and disposal facility. Non-hazardous soils may be disposed at RCRA Subtitle D landfills, or placed within the fenced area, in the case of the selected alternative.

Monitoring. Table 2 contains performance standards to be utilized in the evaluation of monitoring data to determine any impact on the groundwater and area surface waters during the construction of the lagoon cap and the effectiveness of the cap after construction.

10.4 Statutory Determinations

The selected remedy for this Site meets the statutory requirements set forth at Section 121 of CERCLA, 42 U.S.C. 9621. This section states that the remedy must protect human

health and the environment; meet ARARs (unless waived); be cost-effective; use permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and finally, wherever feasible, employ treatment to reduce the toxicity, mobility or volume of the contaminants. The following subsections discuss how the remedy fulfills these requirements.

10.4.1 Protection of Human Health and the Environment

The selected remedy will eliminate, reduce, or control risks posed by eliminating exposure pathways through the capping of the site and deed restrictions and thus ensure adequate protection of human health and the environment. The cap will eliminate direct exposure to potential human or ecological receptors. Potential risks will be either eliminated, reduced,

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Beaunit Circular Knit & Dyeing NPL Site
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or controlled by the remedial action.

The installation of a cap will minimize the amount of leachate generated and will place a barrier between the contaminated surface soils such that surface water will not be allowed to percolate through the contaminated soils. The installation of a site cap designed to 10^{-9} permeability will prevent leaching from the contaminated soils and eliminate the potential for contaminating groundwater and possible migration off-Site. Limited access and deed restrictions will protect the cap and insure its effectiveness into the future. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Site future risks will be reduced to within the 10^{-6} to 10^{-4} range for carcinogens and the Hazard Indices total for non-carcinogens will be less than 1.0.

10.4.2 Applicable or Relevant and Appropriate Requirements (ARARs)

The selected alternative shall comply with all ARARs as described earlier in this Record of Decision. Remedial design often includes the discovery and use of unforeseeable, but necessary, requirements, which result from the planning and investigation inherent in the design process itself. Therefore, during design of the site cap, EPA may, through a formal ROD modification process such as an Explanation of Significant Differences or a ROD Amendment, elect to designate further ARARs which are applicable, or relevant and

appropriate, to this remedy.

10.4.3 Cost effectiveness

Among the alternatives that are protective of human health and the environment and comply with ARARs, the selected alternative is the most cost-effective choice because it uses a treatment technology to address the contaminated soils, eliminating exposure to environmental receptors and eliminating the potential for contaminant leaching to the aquifer.

The selected remedy is cost-effective because it has been determined to provide overall effectiveness proportioned to its costs. The modification to Alternative 3 is the only alternative that will prevent both the generation of leachate

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Beaunit Circular Knit & Dyeing NPL Site
Page 83

and exposure to the contaminated soils.

10.4.4 Utilization of permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner.

Based upon the information presented, the selected remedy will protect environmental receptors, surface water and groundwater quality by reducing exposure leachate production. It provides the best balance among all evaluation criteria, with the following being the most important considerations for the Site:

1. Compliance with applicable or relevant and appropriate requirements;
2. Availability of equipment and materials;
3. Cost of construction, O & M;
4. Elimination of rain water infiltration and, thus, reduction in the volume of leachate and potentially contaminated groundwater released to the environment; and,
5. Elimination of direct contact by environmental receptors
6. Continued monitoring to ensure the remedy continues to be protective of human health and the environment.

10.4.5 Preference for treatment as a principal remedy element

The selected remedy does not satisfy the statutory preference for treatment because treatment of soils at the Beaunit Site considering the minor risk is considered impractical. The remedy does not include treatment of any contaminated soils. Treatment of the source of contamination (the entire lagoon area) is impracticable, because of the large volume of material and the low average contaminant concentrations present. The excavation of such materials would increase the potential for exposure to environmental receptors and temporarily increase the potential for leaching to area groundwater.

APPENDIX A

STATE OF SOUTH CAROLINA

LETTER OF CONCURRENCE

South Carolina
D H E C
Department of Health and Environmental Control
Richard E. Jabbour, DDS

Chairman Cyndi C. Mosteller
2600 Bull Street, Columbia, SC 29201
Brian K. Smith

Rodney L. Grandy
September 29, 1995
Environment

John H. Hankinson, Jr.
Regional Administrator
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: Beaunit Circular Knit and Dyeing Superfund Site
Record of Decision

Dear Mr. HankJason:

The Department has reviewed the Draft Record of Decision (ROD), dated September 29, 1995,

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman

William M. Hull, Jr., MD. Vice

Roger Leaks, Jr., Secretary

Promoting Health, Protecting the

for the Beaunit Circular Knit and Dyeing site and concurs with the selected remedial alternative.

The selected alternative includes source remediation by means of capping contaminated surface and subsurface soil. EPA's selected alternative also includes deed restrictions to preclude the use of the site for future residential use and the restriction of groundwater use beneath the site

for potable purposes. In addition, the Department concurs with the decision to grade the site prior to capping and construct drainage control features to divert surface water away from and around the site. The Department also concurs with the proposals for future monitoring of groundwater, surface water and sediment to determine the effectiveness of the remedial action.

In concurring with this ROD, the Department does not waive any right or authority it may have under federal or state law. The Department reserves any right and authority it may have to require corrective action in accordance with the South Carolina Hazardous Waste Management Act and the South Carolina Pollution Control Act. These rights include, but are not limited to, the right to ensure that all necessary permits are obtained, all clean-up goals and criteria are met,

and to take a separate action in the event clean-up goals and criteria are not met. Nothing in the

concurrence shall preclude the Department from exercising any administrative, legal and equitable remedies available to require additional response actions in the event that: (1) (a) previously unknown or undetected conditions arise at the site, or (b) the Department receives additional information not previously available concerning the premises upon which the Department relied in concurring with the selected remedial alternative; and (2) the implementation of the remedial alternative selected in the ROD is no longer protective of public health and the environment.

Mr. John H. Hankinson, Jr.

September 29, 1995

Page 2

This concurrence with the selected remedy for the Beaunit Circular Knit and Dyeing Site is contingent upon the Department's above-mentioned reservation of rights. If you have any questions, please feel free to contact Mr. Gary Stewart at (803) 896-4054.

Sincerely,

R. Lewis Shaw, P.E.
Deputy Commissioner
Environmental Quality Control

RLS/JAB

cc: Harry Mathis
Kent Coleman
Keith Lindler
Mary Anderson
Gary Stewart

APPENDIX B

RESPONSIVENESS SUMMARY

THE RESPONSIVENESS SUMMARY

Overview

The Environmental Protection Agency (EPA) held an initial public comment period from November 7, 1994 to December 7, 1994, for interested parties to comment on the Proposed Plan which was based on the findings of the Remedial Investigation/Feasibility Study (RI/FS) for the Beaunit Circular Knit & Dyeing Superfund Site in Fountain Inn, South Carolina. A request was made for an extension to the comment period, and the comment period was extended until January 19, 1995.

EPA held a public meeting at 7:00 p.m. on November 14, 1994 at the Fountain Inn Activity Center in Fountain Inn, South Carolina, to overview the results of the RI/FS and the Baseline Risk Assessment, to present the Proposed Plan, and to receive comments from the public.

EPA proposed a remedy consisting of: 1) Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control, and 2) Capping of the Site and Deed Restrictions. Judging from the comments received during the public comment period and the public meeting, the residents and local officials in the Fountain Inn, South Carolina area support the cleanup alternatives proposed by EPA. It should be noted that the Remedy was modified from Alternative Three as developed in the Feasibility Study. The modification was done in consultation with the South Carolina Department of Health and Environmental Control. The design for the cap was modified from a specification of 10-5 to 10-9

This Responsiveness Summary provides a summary of citizen and agency comments, concerns, and questions identified and received during the public comment period, and EPA's responses to those comments and concerns. Section 5.5 of the ROD contains a history of public participation activities during the RI/FS. Other appendices to this document contain related documents including the Proposed Plan, Public Notices, the Official Transcript of the Proposed Plan Public Meeting, and copies of the actual comments received.

2. Response to Public Concerns

During the preparation of the Remedial Investigation and the Feasibility Study, EPA's initial Community Interviews, the Proposed Plan Public Meeting, and the Comment Period with its subsequent extension, there was little concern or prior knowledge expressed regarding the Beaunit NPL Site. There was a general confusion among the public regarding other required environmental

response actions involving the former Beaunit Plant that previously generated sewage that was treated at the former wastewater lagoon that has become the current NPL Site. Area residents expressed concerns regarding odors from the old Beaunit Plant, currently owned and operated by Wilson Sporting Goods for the manufacture of tennis balls. A leak of mineral spirits from the facility resulted in a contaminant plume and subsequent remedial action under separate State/Federal control under the RCRA Statutes. That mineral spirit spill and therequired response led to a series of monitoring wells and later groundwater extraction wells to be installed throughout the area in a Northeastern direction from the Wilson Sporting Goods plant on Georgia Street. The Beaunit NPL Site, located off Valley View Road, has not caused a contaminant plume off-site, and groundwater contamination has not been shown to be a concern at the site itself. Furthermore, the groundwater flow from the Beaunit Lagoon is to the Northwest. Despite these facts, some area residents remain concerned about the Wilson Sporting Goods Plant and any regulatory agency activities in the area, confusing the two separate actions as one. EPA received three comments during the public comment period on the Beaunit NPL Site, all three of which reflect this general confusion.

Responses to Comments Received During Public Comment Period

Comment No. 1: A resident of N. Main Street wrote and stated that she wanted her property put back in the condition it was before pollution occurred.

EPA Response to Comment No. 1: As stated above, the Beaunit Lagoon is not the source of any contamination beyond its boundaries. This resident's comment will be brought to the attention of Wilson Sporting Goods and the district office of SCDHEC. The resident's property was disturbed by the response actions for the mineral spirit spill, not any activities related to the Beaunit Superfund Site.

Comment No. 2: A resident of Georgia Street wrote with several concerns. As a neighbor of the Wilson Sporting Goods Plant, she was concerned about contamination and the effect on her home's value. She expressed concern regarding the deaths of several neighbors from cancer. She specifically asked about the presence of contaminants from the site near her home, if the contaminants

were cancer causing or a threat, and lastly, if there would be a cleanup.

EPA Response to Comment No. 2: The resident's location is near Wilson Sporting Goods Plant, on Georgia Street, not the Beaunit Lagoon, located off Valley View Road. Her comment will be forwarded to the SCDHEC Division of Health Hazard Evaluation. The Beaunit RI/FS did not detect any migration of contaminants, either

carcinogenic or noncarcinogenic off-site. Furthermore, as to future cleanup activities the Beaunit Lagoon will be capped to prevent the potential for any leaching of contaminants detected in the soil into the groundwater.

Comment No. 3: The SCDHEC Division of Health Hazard Evaluation commented on the Beaunit Proposed Plan, after it had been issued. The majority of comments received offered grammatical or word phrasing recommendations. The comments also requested a definition of the NCP. The last item in the comments requested that the Beaunit Superfund Site's Remedial Action include the monitoring of private drinking wells in the area. It should be noted that the reviewer prefaced this request after stating that "we have not evaluated the most recent data to the extent that we can make a complete assessment of public health and how EPA's selected remedy will mitigate any public health implications..."

EPA's Response to Comment No. 3: Since the majority of comments were received after the Proposed Plan was issued, the comments regarding grammar and phrasing were not timely and can't be addressed. In answer to the request for a definition of the NCP, this ROD has included a glossary following the Table of Contents. The NCP is the National Contingency Plan, the specific regulations published in the Federal Register outlining how EPA is to implement CERCLA, commonly known as Superfund. Relative to the request for required monitoring of area private drinking wells, EPA wishes to again note that the SCDHEC agency comment's preface stated a lack of evaluation of the data. The data showed no off-site groundwater contamination, therefore any detection of contamination in a private drinking well would be from another source, and beyond the scope of the Beaunit RI/FS and this ROD. The comment has been referred to the local SCDHEC District Office for their attention.

South Carolina
D H E C
Department of Health and Environmental Control
Chairman William E. Applegate, III,
Chairman John H. Burriss
Robert Mills Complex, Box 101106

Commissioner: Douglas E. Bryant
Board: Richard E. Jabbour, DDS,
Robert J. Stripling Jr., Vice
Sandra J. Molander, Secretary

Tony Graham, Jr., MD
Columbia, SC 29211
John B. Pate, MD

Promoting Health, Protecting the

Environment

Memomndum

TO: Steve Sandler
Remainl Project Manager
Environmental Protection Agency

FROM: Lovyst L. Luker
Project Adminitrator
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

DATE: January 10, 1995

RE: Beaunit Proposed Plan

The South Carolina Department of Health and Environmental Control, Division of Health Hazard Evaluation, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry reviewed the Proposed Plan Fact Sheet for the Beaunit site. We appreciate the opportunity to review and comment on this document.

We are submitting a memorandum for your consideration of the comments that we are providing for the proposed plan for this site. We are also requesting to be added to your mailing list to receive a ROD when it is in draft form so that we can provide comments at that time. If you have any questions about our comments, or would like more information, please call Todd Going at 737-4175.

cc. Richard Kauffman, ATSDR
Bob Safay, Regional Representative

South Carolina
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Sandra J. Molander, Secretary

Environment

Promoting Health, Protecting the

Memomndum

TO: Lovyst L. Luker
Project Administrator
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

FROM: William T. Going, MPH
Environmental Quality Manager
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

DATE: January 10, 1995

E: Beaunit Proposed Plan Fact Sheet Comments

Please find attached a copy of the comments for the Beaunit Proposed Plan Fact Sheet. The Environmental Protection Agency (EPA) released this document in November 1994 and the public comment period will end on January 17, 1995. Our review of this document represents an addition to our Fiscal Year 1995 workplan.

The Agency for Toxic Substances and Disease Registry (ATSDR) requested that we review the Record of Decision (ROD) for this site during first quarter, FY 1995. However, the ROD has not been finalized and we do not expect to receive it until after January 1995. Enayet Ullah requested that the EPA mail a copy of the ROD to our office for review. We will review the ROD and provide comments while it is in the draft version.

COMMENTS FOR THE PROPOSED PLAN FACT SHEET

BEAUNIT CIRCULAR KNIT & DYEING SUPERFUND SITE

The South Carolina Department of Health and Environmental Control under a cooperative agreement with the Agency for Toxic Substances and Disease Registry, submit the following comments for the Proposed Plan Fact Sheet, dated November 1994, for the Beaunit Circular Knit & Dyeing Superfund site in Greenville Connty, South Carolina.

Site History

- 1) Third Paragraph, Second Sentence. "Records available do not..."

Please consider changing this sentence to read "Available records do not..."
- 2) Fifth Paragraph, First Sentence. "In 1979, the plant operators determined that the former...should be razed..."

Please consider changing the word "razed" to "demolished," "torn down," etc.

- 3) Please consider adding the following narrative between the sixth and seventh paragraphs.

In 1991, SCDHEC, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), released a preliminary health assessment for the Beaunit site. The preliminary health assessment classified the site as an indeterminate public health hazard and recommended that additional environmental samples be collected.

Summary of Alternatives

- 4) Alternative 1: No Action, First Paragraph, First Sentence. "A no action alternative is required by the NCP..."

Please define NCP. Also, please consider writing the document in the active voice instead of the passive voice. The active voice will allow the writer to use less words to make his/her point and will enable the reader to grasp the meaning of the sentence easier.

EPA's Preferred Alternative

- 5) We have not evaluated the most recent data to the extent that we can make a complete assessment of public health and how EPA's selected remedy will mitigate any public health implications from exposure to contamination at the Beaunit site. However, we feel that the groundwater monitoring program in EPA's preferred alternative should be expanded to include private drinking water wells in the area. The community has expressed concerns about adverse health effects from exposure to contaminants in their drinking water. Therefore, EPA's monitoring of private well water will help to alleviate community health concerns about the site.

BEAUNIT SUPERFUND SITE MAILING LIST COUPON

If you have had a change of address and would like to continue to receive site related information or would like for EPA to add your name and address to the mailing list for the Beaunit Superfund Site, please complete this self-addressed form. If you have any questions regarding this mailing list, please call Cynthia Peurifoy at 1-800-435-9233.

NAME: _____

ADDRESS: _____

TELEPHONE: () _____

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Beaunit Superrid Site is important in helping EPA select a final remedy for the Site. You may use the space below to write your comments, then fold and mail.

A response to your comment will be included in the Responsiveness Summary.

I want my property put back in the condition
it was before this pollution occured.

Edna L. Reece

200 Georgia Street
Fountain Inn, SC 29644
November 29, 1994

Ms. Cynthia Peurifoy
Environmental Protection Agency
North Superfund Rededial Brands
345 Courtland Street NE
Atlanta, Georgia 30365

Dear Ms. Peurifoy:

I am a resident of Fountain Inn near the Wilson Sporting Goods manufacturing facility which was formerly the site of the Beaunit Textile plant. My concern is whether or not this has been determined to be a contaminated area.

A year or two ago, my next-door neighbor applied for a low-interest loan for home repairs and was informed that one of several particulars pending approval was the outcome of an investigation of possible contamination at or near her home. (At least, this is the best I could understand what she stated.) Obviously, I am concerned about how this affects the value of my own property.

Also, during the eleven years I have lived here, there have been five deaths of very close neighbors having cancer and yet another who has been diagnosed with some form of cancer of which type I don't know. All of these live within a few hundred feet to a few hundred yards of my own home. Most recent, was Mr. Campbell who lived on Andrews Lane who died only two or three months ago with cancer of the esophogus. There may have been more cancer related deaths, but these are the ones of which I am aware. This seems to me to be a high percentage of cancer-related deaths for such a small area and is becoming a growing concern to me.

My questions are: 1) Have contaminants been found? 2) If so, are

there any cancer-causing contaminants that would be a threat to the health of those of us living in near proximity of the area?
3) If so, are there any plans for a clean-up?

These matters are respectfully submitted for your consideration, and I trust I will hear from you soon.

Sincerely yours,

Carolyn Rumfelt

mtf

APPENDIX C

PROPOSED PLAN

SUPERFUND PROPOSED PLAN FACT SHEET

Beaunit Circular Knit & Dyeing Superfund Site
Fountain Inn, Greenville County, South Carolina

U.S. Environmental Protection Agency, Region IV, Atlanta, GA
November 1994

INTRODUCTION

southeast of the City of Greenville

13). The Site consists of the former The United States Environmental Protection Agency (EPA) its surroundings, that serve a is issuing this Proposed Plan Fact Sheet for the Beaunit and finishing plant about 400 yards Circular Knit & Dyeing Superfund site in Fountain Inn, wastewater lagoon was built in 1951 South Carolina. This Proposed Plan is issued to present the 1977 when the adjacent plant alternatives that the EPA has considered for the surface soil sewage. In 1980 the wastewater and groundwater contamination found at the Beaunit site. around the lagoon were demolished and

Fountain Inn is 15 miles (See Figure 1-1, page wastewater lagoon, and former knitting, dyeing, east of the Site. The and ceased operations in connected to municipal treatment structures

EPA, in consultation with South Carolina Department of Health and Environmental Control (SCDHEC) will select within a secured fence. The adjacent a final remedy for the site after the public comment period operated by Wilson Sporting Goods for has ended and the information submitted during this time tennis balls. has been reviewed and considered. Changes to the preferred alternative, or a change from the preferred Valley View Road. Land use within alternative to another, may be made if public comments or includes small farms, residential areas, additional data indicate that such a change would result in industrial facilities. Within .25 a more appropriate solution. The final decision regarding Valley View Road are Valley View the selected remedy will be documented in a Record of Decision (ROD) after EPA has taken into consideration all are the Valley View apartments comments from the public. Upon timely request, EPA will northeast of the Site. Water is extend the public comment period by 30 additional days. residents and businesses through a public Terms in bold print are defined in a glossary on page 12 of groundwater supply wells exist at this fact sheet.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comment Period: Comprehensive Environmental Response, Compensation November 7, 1994 and Liability Act (CERCLA). This document summarizes December 7, 1994 information that can be found in greater detail in the Remedial Investigation/Feasibility Study (RI/FS) Reports Meeting and other documents contained in the Administrative November 14, 1994 Record, located at the Information Repository. 7:00 P.M.

Inn Activity Center
The information used in proposing the response action is Main Street available at Fountain Inn Public Library located at 400 Fountain Inn, SC Main Street in Fountain Inn, South Carolina (803-862-251-1376) and at the Superfund Record Center at EPA Region written comments or call: TV Office located at 345 Courtland Street, Atlanta, GA or Cynthia Peurifoy

the lagoon was partially inactive and enclosed plant currently is the manufacture of The Site is located off one mile of the Site several businesses, and miles of the Site along Apartments, power lines, dwellings to the Site located about 100 yards available to area water supply system. No

Public

Monday,

- Wednesday,

Public

Date: Monday,

Time:

Place: Fountain

200 N.

Provide

Steven Sandler

(404-437-0506).
Environmental Protection Agency

U.S.

North

Superfund Remedial Branch

DESCRIPTION AND HISTORY

345

Courtland St, NE

Atlanta

, Georgia 30365

The Beaunit Site occupies approximately 1.3 acres on the

1-800-435-9233

northwest side of Fountain Inn South Carolina.

Site History

treatment plant varied with the

plant. The design capacity of the

A wastewater treatment plant, which consisted of a modified

constructed in 1951, was 300,000 gpd. By

activated sludge system, was built at the location in 1951. It

rate increased to 750,000 gpd. In

was constructed to treat industrial wastewater from the knitting

capacity of the treatment plant was rate at

dyeing, and finishing plant that was located approximately 400

the permitted discharge flow rate was

yards to the east. The treatment plant units included a bar

September/October 1977, the discharge of

screen, an aeration basin (lagoon), an aeroaccelerator, a

from the knitting, dyeing, and

clarifier, and a post aeration tank. "As built" drawings for

discontinued due to the plant's shutdown.

these units could not be located, but these units were believed

sometime in 1988, the discharge to

to be located as indicated on Figure 1.2 (page 14). The

water from roof drains, a cooling tower

original design of the plant was to provide treatment for an

overflow.

average flow rate of 300,000 gallons per day (gpd) of textile

wastewater. The lagoon had a volumetric capacity of 430,100

operators determined that the former

gallons and received wastewater via a pipeline (the influent

structures on the Site should be razed,

pipe).

existing lagoon be filled. The City of

a small brick building and

In 1973, wastewater from the plant was described as passing

on Site, graded the Site, and partially

through an oil separator into the lagoon. The lagoon was

the demolition debris and surrounding

equipped with five 15 h.p. aerators, which were also used to

from the tennis ball manufacturing facility

supply air to the aeroaccelerator. The wastewater discharge

The flow rates to the

production rate of the

treatment plant,

1963, the discharge flow

1963, the design

600,000 gpd. In 1976,

540,000 gpd. In

wastewater to the lagoon

finishing plant was

From December 1977 until

the lagoon consisted of

blowdown, and chiller

In 1979, the plant

wastewater treatment

and that the then-

Fountain Inn demolished

miscellaneous structures

filled the lagoon with

soil. Additional fill

was placed in the lagoon

and was comprised of thin sheet of
may also have been treated with coagulants and neutralizers,
rubber tennis ball and racquet ball flashing
e.g., lime and alum, in the clarifier at the lagoon Site. A
racquet ball containers, excess tennis ball
suction pump was operated to return collected sludge from the
roofing material, wooden pallets, and
aeroaccelerator to the lagoon. A sludge drying bed, located
current features of the Site are
approximately 20 yards north of the lagoon, was used to dry
(page 15).
accumulated waste sludge from the treatment operation. The
lagoon was designed to discharge into an unnamed creek that
in 1985, South Carolina Department
is located to the west end of the lagoon. There may also be a
Environmental Control (SCDHEC) personnel
pipeline that bypassed flow around the lagoon and discharged
the Site fence was missing. Wilson
flow directly to the unnamed creek. The unnamed creek flows
ball manufacturer) subsequently
northwest and eventually joins Howards Branch.
The fence is inspected on a regular

remained inactive since 1988 and access
The lagoon was originally put into operation in October 1952
fence and locked gate.
and accepted treated wastewater from knitting and dyeing
operations for a textile plant manufacturing fabric for wearing
on the Site began in the early 1970's
apparel. Records available do not permit an accurate
to SCDHEC regarding discoloration
summation of the chemicals used or quantities discharged.
Beaunit" (probably referring to the
However, the following substances were germane to the textile
Howards Branch). On November 7, 1973,
knitting industry and may have been used: soluble and
public hearing to consider whether
insolubilized wetting agents, dispersing agents, surfactants,
South Carolina's Water Classification
defoamers, soaps, detergents, weightors, naphthol, acid, and
SCDHEC conducted a site investigation
disperse dyes and pH adjusters. Although the aforementioned
reported detections of volatile organic
materials may have been used in the process, it is unlikely that
water samples collected from the lagoon
all of them would be present in the wastewater. These
creek, and PCBs and metals in the soil
materials were highly diluted by successive rinses. Others
collected from the Site. Based on the
reacted and were neutralized or precipitated out during the
SCDHEC's 1985 Site Investigation, EPA
dyeing process, prior to the subsequent final treatment through
Ranking System (HRS) score of 32.44 for
the wastewater treatment system. Many substances were

blue polyethylene,
and cores, tennis and
felt, golf balls, old
surrounding soils. The
presented on Figure 1.3

During a site inspection
of Health and
noted that a portion of
Sporting Goods (tennis
repaired the Site fence.
basis. The Site has
is restricted by the

Regulatory involvement
when citizens complained
of the "stream below
unnamed creek and
SCDHEC conducted a
possible violations of
System had occurred.
on June 13, 1985, and
compounds in surface
and nearby unnamed
and sediment samples
results obtained from
developed a Hazard
the Site. In June 1988,

EPA proposed to include the Site on absorbed in the materials being dyed, particularly the dyes. List (NPL). The Site is ranked amongst scores 32.87 - 31.94) on the NPL.

Engineering-Science, an Atlanta consulting firm retained by the except for one location. Bedrock was Potentially Responsible Parties, conducted RI field activities beneath the surface. This finding at the Site in April 1992 and from October 19, 1992 to December 10, 1992. shallow bedrock layer beneath the Site.

The RI field activities were as follows: were not found to be a concern and were

contaminants of concern. The potential Performed topographical and geophysical surveys in chemicals from any media at the Site is not a April 1992 before preparing the draft RI Work Plan;

Installed seven (three upgradient and four detected in earlier SCDHEC sampling downgradient) monitoring wells; were found not to be a concern.

Collected groundwater samples from monitoring contaminants of concern were as follows: a) wells; aromatic compounds (PNA's) and

manganese), b) subsurface soil-PNA's and Collected surface water and sediment samples from sediments-polychlorinated biphenyls the lagoon, the unnamed creek, a pond (located and metals (antimony, beryllium, and upstream of the unnamed creek), and Howards groundwater-barium, chromium, and Branch;

Collected surface soil samples from 24 locations that detected in one groundwater samples at 4.5 included 3 background surface soil samples; water MCL is 4.0 ug/L.) Manganese

MCLG's in samples from three wells, one Collected subsurface soil samples from 15 soil background well. No other metals exceeded borings that included 3 background soil borings, 5 soil standards that were found.

the National Priorities the Group 18 Sites (HRS

found at this depth between 60 to 100 feet eliminated concern that and travel across a

2. Volatile organics not retained as volatilization of concern.

3. Lead and cadmium, of lagoon sediments,

4. Potential surface soil-polynuclear metals (arsenic and manganese, c) lagoon (PCBs), benzo(a)pyrene, manganese) and d) manganese.

5. Beryllium was ug/L (federal drinking was detected above of which was a federal drinking water

borings along the influent pipeline to the lagoon, 2 soil borings along an effluent pipeline from the indicated that a) the two primary pathways that lagoon, 2 soil boring in the former sludge drying bed concern may travel were surface runoff area, and 3 soil borings in the fill material area; infiltration/leachate migration and b) a secondary pathway

contaminants would be groundwater

Surveyed monitoring wells and sampling locations; waters from the former sludge drying beds and

Factoring these migration paths into the risk

the Site, it was determined that the

Conducted biota survey.

are not likely to migrate because the

to comprise a total migration pathway

The sampling locations are shown on Figure 1.3. The results completed at the Site.

of the RI field activities were presented to EPA in the RI report.

ACTION

RESULTS OF THE REMEDIAL INVESTIGATION
the Beaunit Superfund Site addresses

soil and groundwater contamination

Based on the work listed above, a conceptual model was Sediments and surface water were sampled

developed for the Site. There were several differences Investigation as well. The planned action

between what was believed to exist at the Site before the the public, and in particular, investigation and what the Remedial Investigation showed. from exposures to contaminated

groundwater. Additional sources or operable

1. Bedrock was believed to occur at about 30-35 feet below land surface in the study area. During the RI bedrock was not

SUMMARY OF RISK ASSESSMENT

impact to local plants and animals are

endangered or threatened species have

CERCLA directs EPA to protect human health and the area of the State, none were specifically

environment from current and potential future exposure to during the RI/FS. Regardless, the

hazardous substances at the Site. A risk assessment was

6. The RI data

site contaminants of

and

of migration of the

discharge to surface

or fill areas.

assessment work done at

contaminants of concern

four necessary elements

are not likely to be

SCOPE OF THE PROPOSED

This Proposed Plan for

remedies for surface

present at the Site.

during the Remedial

is necessary to protect

environmental receptors

surface soils and

units are not expected.

of the Site, significant

not expected. While

been identified in this

located at the Site

environmental risk

assessment did indicate that surface soil conducted to evaluate the potential current and future risks environmental receptors would need to be associated with exposure to the site contaminants. development of remediation alternatives.

Human Risk

An evaluation was made of all potential exposure routes which could connect contaminants of concern (COC's) at the the RI/FS reports and the risk Site with people living or working in the area. Exposure by levels were developed that would be each of these pathways was mathematically modeled using health and the environment. These generally conservative assumptions. the basis of any remedial activity.

were evaluated in the FS report using The Baseline Risk Assessment (BRA) for the Site was goals for Site cleanup. The ground prepared by Roy F. Weston, Inc. for EPA Region IV. The based on state and federal standards, BRA was finalized on November 24, 1993. EPA determined Contaminant Levels (MCLs). The as a result of the risk assessment that potential future levels were established to minimize Site residential exposures to benzene, beryllium, chromium, protection of ground water. The manganese, 2-methylnaphthalene, and naphthalene in the Beaunit Site are presented in Table groundwater were of concern. It should be noted these risk levels incorporated both site-related and background-related risks (since some contaminants, such as beryllium, chromium, a variety of cleanup methods that and manganese, existed in the study area naturally). In the site. As required by CERCLA, a no BRA, EPA determined that the risks to human health from alternative was evaluated to serve as a basis for contaminants in surface soils were within EPA's acceptable other active cleanup methods. The risk range and stated that remediation of surface soils would address site related contamination which not be required for the protection of human health. However, goals are presented in this Proposed Plan. the BRA also determined that site surface soils did present a risk to ecological receptors. Arsenic and nickel were identified Proposed Plan for each alternative as the chemicals of concern. While EPA determined that there of the low and high estimates for each were no significant concerns over surface soil contamination provided in greater detail in the as applied to human health, the Agency required that soil contamination still be addressed in the feasibility study for the

exposure to addressed in the

SUMMARY OF ALTERNATIVES

Based on the results of assessment, cleanup protective of human cleanup levels will form Various alternatives these cleanup levels as water cleanup levels are referred to as Maximum soil/source cleanup risks and insure future cleanup standards for A (see page 16). The FS report evaluated could be used at this further action comparison with the cleanup methods to exceeds the cleanup Costs shown in the represent the midpoint alternative which are Feasibility Study.

Site because of concern for ecological receptors. Subsurface
Action
soil, surface water and sediments were not identified as media
of concern for the Site. The contaminants of concern,
is required by the NCP to be carried
exposure concentrations, risk levels, and hazard indices are
for detailed comparison. Under this
provided in Tables 1.1 & 1.2 of the Feasibility Study.
actions will be conducted for

soil. Site monitor wells will be
Actual or threatened releases of contaminants from the Site, if
The current fencing will not be
not addressed by one of the alternatives in this plan, may
under this program. No groundwater
present an imminent and substantial endangerment to public
remediation activities will be conducted. This
health, welfare or the environment.
include natural attenuation of

soil contaminants. Under this option,
Environmental Risk
groundwater and surface soil will

Metals will tend to persist in sediment
A qualitative risk assessment was conducted to determine if
Investigative derived waste (materials from well
contaminants present at the Site have impacted plant life or
sampling) from the RI which are currently
animals in the area. Given the small size and industrial nature
will be disposed and the Site will remain

in its current condition.
years thereafter. The results will then

monitoring requirements. Site
Mid-point of the range of costs for Alternative 1 in present
provide early warning of unacceptable
worth is \$5439.
and (2) allow for a better understanding

attenuation rates.

Alternative 2 - Groundwater, Surface Water, and Sediment
Monitoring and Groundwater Use Restrictions/Deed
pipeline location P5 will be excavated and
Restrictions
will will be placed within the fenced area.

grid will be sampled. The extent of
Alternative 2 combines an institutional control general response
determine the amount of soil to be
action for groundwater and the no action general response

Alternative 1: No

A no action alternative
forward as a baseline
alternative no remedial
groundwater and surface
plugged and abandoned.
actively maintained
monitoring or
option does, however,
groundwater and surface
organic contaminants in
biodegrade naturally.
and soils.

drilling and soil
being stored on-site

and annually for three
be assessed for future
monitoring will (1)
contaminant migration,
of the natural

The "hot spot" at
the excavated material
Initially a 5' by 5'
contamination will
excavated. It is

believed that 2' of depth will be sufficient action for surface soil. Under this alternative, a monitoring or less.

program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for specification of 10-9 permeability identifying changes in the site conditions. Groundwater entire area within the fence.

samples will be collected from six of the monitoring wells and developed in the Feasibility Study, included from three surface water and sediment sampling locations designed to meet a 10-5 permeability.

from the unnamed creek); these samples will be analyzed concur that the cap should be semi-annually for the first two years and annually for three specification of 10-9 permeability, rather years thereafter. The results will be assessed for future permeability contained in the alternative as monitoring requirements. Site monitoring will (1) provide Feasibility Study. The change was based on early warning of unacceptable contaminant migration, and (2) the Sommers model, commonly used to allow for a better understanding of the natural attenuation rates, caps to prevent leaching from soils of

No remedial action will be conducted for groundwater and SCDHEC feel the higher degree of surface soil. This alternative does include natural attenuation built to 10-9 specification would insure and biodegradation of groundwater and surface soil met in the groundwater. The exact contaminants. Under this alternative, organic contaminants in construction of the cap will be determined during groundwater and surface soils will degrade naturally. to meet a design specification of 10-9

Institutional controls would prevent use of the shallow the use of synthetic materials as part of groundwater and preclude use of the Site for residential layer cap over the Site, rather than just construction since metals will not biodegrade and would tend The cap will be placed over contaminated to persist in soils. The investigative derived waste from the RI fenced area to serve as a barrier to will be disposed and the site area will be maintained in its receptors that may be exposed to the current condition. will be graded and the lagoon will be

located on the east side of the lagoon

Mid-point of the range of present worth estimate costs for backfill the lagoon. The water currently

Alternative 2 is \$276,887.

be removed. The cap will be placed

The cap will be of appropriate

with an area 20' by 20'

A cap designed to meet a

will be placed over the

Alternative 3, as

a native soil/clay cap

Both EPA and SCDHEC

designed to meet a

than the 10-5

developed in the

modeling the Site with

predict effectiveness in

contaminants. EPA and

impermeability of a cap

that the RGO's would be

details of the

the Remedial Design, but

will probably require

a multiple component

native soil and clay.

surface soil within the

potential ecological

surface soils. The Site

backfilled. The waste

will also be used to

in the lagoon will not

over the filled lagoon.

Alternative 3 - Groundwater, Surface Water, and Sediment
facilitate direct stormwater run-off.

Monitoring/Grading-Drainage Control-Capping of Site and
Deed Restrictions

Site will involve the use of heavy

dozers, loaders, scrapers, and compactors)

Alternative 3 combines the institutional control general
loose soil and modify the surface

response action for groundwater and the containment general

Site will control surface runoff and

response action for surface soil. Under this alternative, a

monitoring program for groundwater, stream surface water, and

stream sediment will be implemented to provide a method for

cap, grass will grow on the Site and the

identifying changes in the site conditions. Groundwater

by cutting the grass and periodically

samples will be collected from six of the monitoring wells and
damage.

from three surface water and sediment sampling locations

from the unnamed creek). Samples from those locations will

or other drainage control feature will

be collected and analyzed semi-annually for the first two years

divert surface water away from and

around the Site. Therefore, surface water run-off will not

carbon will be sent off-site for

cause excessive soil erosion and contaminant transport. Based

disposal. The effluent from the carbon system

on the gradient of the Site, drainage controls could be

pipe to the unnamed creek.

constructed along the southern and southeastern border of the

Site.

treatment unit will be located on the Sites

foundation with a protection overhead

Deed restrictions would prevent new construction on the Site

to protect the units.

Several assumptions were made during EPA/SCDHEC change

in design specifications for the cap. Utilizing cost comparisons

groundwater treatment is based on the size of

to other recent 10-9 cap designs for sites in this area capital

pumping and treatment flow rates,

costs are estimated to be \$32,000 additional for the Site

efficiency (i.e., removal of contaminants from

remedy. Several computer models of caps that could achieve

The extent of contaminants in

10-9 were run on RACER software (Remedial Action Cost

to be localized because the RI data

Engineering and Requirements System, Dept. of Air Force,

existence of a significant plume. The

1993). From those efforts, it is believed that the capital cost

gradient as to

The grading work at the

equipment (such as

to spread and compact

gradient. Grading the

reduce erosion.

After placement of the

Site will be maintained

inspecting the cap for

An earthen berm, ditch

also be constructed to

60 days. The removed

regeneration or

will be discharged via a

The entire water

property. A concrete

shed will be constructed

The duration of

the contaminated plume,

and extraction

the water bearing zone).

groundwater is expected

did not indicate the

pumping and treatment

flow rates are 5 gpm. For estimation of the Modified Alternative 3 Site cap would be between that water treatment would continue for \$212,000 to \$220,000, below the \$225,000 high range of the samples will be collected monthly from the Feasibility Study estimate of capital costs for the 10-5 cap. the treatment units to periodically EPA believes that a conservative estimate of the total costs for standards are being met. Samples will be the Selected Remedy, the modified Alternative 3 is \$580,882. PNAs, beryllium, chromium VI, and

years, an evaluation will be conducted Alternative 4 - Groundwater Pumping and treatment is necessary. After treatment Treatment/Grading and Drainage Control-Capping of Site groundwater, stream surface water and and Deed Restrictions. monitoring program similar to Alternative 2

Treatment would not begin until each Alternative 4 combines the removal and treatment general and groundwater samples are analyzed response action for groundwater and the containment general confirm the presence of the contaminants response action for surface soil. Deed restrictions are also their concentrations. included. Under this alternative, groundwater will be pumped from monitoring wells that will be determined during the pipeline location P5 will be excavated and remedial design. For cost and design estimation purposes, will be placed within the fenced area. MW4S and MW5S have been designed as the extraction wells. will be placed over contaminated surface These wells will be pumped at a combined rate of area to serve as a barrier to potential approximately 5 gallons/minute. The contaminants of concern receptors that may be exposed to the include benzene, chromium VI, manganese, naphthalene, 2- will be graded the lagoon will be methylnaphthalene, and beryllium. To remove beryllium, of clay will first be compacted over chromium, and manganese, a dual filtration cartridge system soils. The waste located on the east side of will be used. The first cartridge will be a 3 micron filter. used to backfill the lagoon. The water This cartridge will remove the elarger particulate that may foul will not be removed. The cap will be the smaller (second) filtration cartridge. A precipitation system lagoon. Then 12 inches of native soil may also be needed prior to the filtration system to remove silt clay. The cap will have a maximum or other larger particles, i.e., iron, manganese, and chromium. cm/sec.

purposes, it is assumed five years. Water influent and effluent of verify that treatment analyzed for benzene, manganese. After five to determine if further has discontinued, a stream sediment will be initiated.

monitor well is sampled at least one time to of concern (COCs) and

The "hot spot" at the excavated material A native soil/clay cap soil within the fenced ecological and human surface soils. The Site backfilled and 18 inches the graded surface the lagoon will also be currently in the lagoon placed over the filled will be graded over the permeability of 1×10^{-5}

The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L. facilitate grass growth. Grass will provide

Approximately 5,000 yd³ of clay and 3,000 yd³ of soil will be required for the construction. These materials, at the site, will be spread and graded over the entire site. The cap will be of appropriate gradient as to methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate involves the use of heavy equipment from MW4S and MW5S will require carbon replacement every loaders, scrapers, and compactors) to spread

and compact loose soil and modify the surface gradient. or a 5-ft grid for the pipeline location. Grading the Site will control surface runoff and reduce erosion. location. Excavation will be completed

soil sample locations that have nickel and arsenic concentrations. With the implementation of a natural soil and clay cap, grass remediation goals. below their respective preliminary A range of costs was will grow on the Site and the Site will be maintained by range assumes the cutting the grass and periodically inspecting the cap for volume of 20 ft by 20 ft damage. locations (shown in developed for this option. The lower volume of 5 ft by 5 ft

surface soil excavation will be limited to a scenario assumes all surface soil excavation will be limited to a are below Remedial Goal An earthen berm, ditch, or other drainage feature will be The total volume of by 2 ft around four RI sample approximately 120 yd³. constructed to divert surface water away from and around the Alternative assumes that Figure 3.6 of the Feasibility Study) and a require excavation and Site. Therefore, excessive surface water run-off will be excavation for this be 2 ft at pipeline location P5. This disposal. This diverted from the Site and not cause surface soil erosion and Costs for Alternative 4 in present worth have a mid-point of samples collected around the "hot spots" of the Site, Options (RGO's) for surface soil. The higher range costs for this component of Alternative 4. all surface soils within the Site will

disposal. The total volume of Costs for Alternative 4 in present worth have a mid-point of

The natural soil will erosion control. yd³ of soil will be materials, at the graded over the entire gradient as to

The grading at the Site (such as dozers,

that sampling location around the exceedance within a boundary of arsenic concentrations remediation goals.

A range of costs was range assumes the volume of 20 ft by 20 ft locations (shown in volume of 5 ft by 5 ft scenario assumes all are below Remedial Goal The total volume of approximately 120 yd³. Alternative assumes that require excavation and excavation for this

scenario is approximately 5,000 yd³.
\$6,042,662.
surface soil sampling and analyses will

the total cost of this option. Soil will
Alternative 5 - Groundwater, Surface Water, and Sediment
depth. The excavated soil will be
Monitoring/Excavation of "Hot Spots" and Off-Site
site landfill for disposal. The soil may be
Disposal and Deed Restrictions
landfill if the soil is not

hazardous. Based on information gained
Alternative 5 combines the institutional control general
will pass TC criteria and may be
response action for groundwater and the removal and off-site
an off-site solid waste landfill.
disposal general response actions for surface soil. Under this
alternative, a monitoring program for groundwater stream
be backfilled and graded. The
surface water, and stream sediments will be implemented to
will involve the use of heavy
provide a method for identifying changes in the Site
dozers, loaders, scrapers, and compactors)
conditions. Groundwater samples will be collected from six of
loose soil and modify the surface
the monitoring wells. Three surface water and sediment
Site will control surface runoff and
sampled. Samples from these locations will be collected and
areas.
analyzed semiannually for the first two years and annually for
three years thereafter. The results will be assessed for future
excavation will impact the number of
monitoring requirements. Site monitoring will (1) provide
needing excavation, amount of
allow for a better understanding of the natural attenuation rates.
deed restrictions would prevent future

Site.

Within the Site, surface soil that contains COC concentrations
above cleanup levels, discussed in the Feasibility Study and in
of Alternative 5 are estimated to be in
the Table in this fact sheet (RGO's), will be excavated and
\$1,370,675, with the mid-point of
disposed at an off-site landfill. Four surface soil samples
Alternative as \$806,934.
collected during the RI had arsenic and/or nickel
concentrations above soil action levels. Additional soil
Groundwater Pumping and Treatment/
samples will be collected in a 20-ft grid around the sampling
Spots" and Off-site Disposal and Deed
location. At the pipeline location P5, soil samples will be
collected at the corners of a 5-ft grid. The soil samples will be
analyzed for arsenic and nickel and, if a sample from this

Additionally the cost of
be a significant part of
be excavated to a 2 ft.
transported to an off-
disposed in a Subtitle D
characteristically

during the RI, the soil
accepted for disposal at

The excavated areas will
grading work at the Site
equipment (such as
to spread and compact
gradient. Grading the
with the excavated

The extent of soil
analyses, amount of soil
backfill. Once again,
construction at the

The present worth costs
the range of \$243,193 to
costs for this

Alternative 6 -

Excavation of "Hot
Restrictions

Alternative 6 combines

the removal and treatment general additional sampling exceeds the cleanup levels for arsenic or groundwater and the removal and disposal nickel, soil samples will be collected from a 20-ft grid around for surface soil. Under this alternative

groundwater will be pumped from monitoring wells that will soil that contains COC concentrations be determined during the remedial design. For cost and design will be excavated and disposed at an off-estimation purposes, MW4S and MW5S have been designed as surface soil samples collected during the RI the extraction wells. These wells will be pumped at a nickel concentrations above soil action combined rate of approximately 5 gallons/minute. The samples will be collected in a 20-ft grid contaminants of concern include benzen, chromium VI, location. At the pipeline location P5, soil manganese, naphthalene, 2-methylnaphthalene, and beryllium. collected at the corners of a 5-ft grid. The soil To remove beryllium, a dual filtration cartridge system will be for arsenic and nickel and, if a used. The first cartridge will be a 3-micron filter. This additional sampling exceeds the cleanup cartridge will remove the larger particulate that may foul the nickel, soil samples will be collected from smaller (second) filtration cartridge. (A precipitation system sampling location or a 5-ft grid for the may also be needed prior to the filtration system to remove silt the exceedance location. Excavation or other larger particles, e.g., iron, manganese, and chromium.) a boundary of soil sample locations The second filtration cartridge will be a 0.3-micron filter. This arsenic concentrations below their cartridge will remove beryllium to below 4 ug/L. remediation goals. A range of cost was

option. The lower range will assume the The effluent from the submicron filtration cartridge will pass will be limited to a volume of 20 ft by through a carbon adsorption unit. The carbon adsorption unit four RI sample locations and a volume of will remove the benzene, naphthalene, and 2-pipeline location P5. This scenario methylnaphthalene. The adsorption unit will hold collected around the "hot spots" are below approximately 180 lbs. of carbon. The activated carbon system The total volume of excavation for this properly sized for the groundwater characteristics and approximately 120 yd³. The higher range units of extraction rate from MW4S and MW5S would require carbon of "hot spots" assumes that all surface

response action for
general response action

Within the Site, surface above cleanup levels site landfill. Four had arsenic and/or levels. Additional soil around the sampling samples will be samples will be analyzed sample from this levels for arsenic or a 20-ft grid around that pipeline location around will be completed within that have nickel and respective preliminary developed for this surface soil excavation 20 ft by 2 ft around 5 ft by 5 ft by 2 ft at assumes all samples RGOs for surface soil. scenario is excavation for removal

replacement every 60 days. The removed carbon will be sent will require excavation and disposal. The off-site for regeneration or disposal. The effluent from the excavation for this scenario is approximately carbon system will be discharged via a pipe to the unnamed the cost of surface soil sampling and creek. significant part of the total cost of this

excavated to a 2 ft. depth. The excavated The entire water treatment unit will be located on the site to an off-site landfill for disposal. The property. A concrete foundation with a protective overhead a Subtitle D landfill if the soil is not shed will be constructed to protect the units. hazardous. Based on information gained

will pass TC criteria and may be The duration of groundwater is based on the size of an off-site solid waste landfill. the contaminated plume, pumping and treatment flow rates, and extraction efficiency (in other words, removal of excavation will impact the number of contaminants from the water bearing zone). The extent of needing excavation, amount of contaminants in groundwater is expected to be localized the amount of grading required following because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water estimates for Alternative 6 range from treatment would continue for five years. Water samples will \$8,865,058, with a mid-point cost of \$6,302,948. be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards Groundwater, Surface Water, and Sediment are being met. Samples will be analyzed for benzene, polynuclear aromatics (PNA's), beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment the institutional control general has discontinued, a groundwater, stream surface water, and groundwater and a second combined stream sediment monitoring program similar to Alternative 2 general response action for surface soil. will be initiated. Treatment will not begin until each a monitoring program for groundwater, monitoring well is sampled and analyzed at least one time to and stream sediment will be implemented confirm the presence of the COCs and their concentrations. identifying changes in the Site

soils within the Site total volume of 5,000 yd³. Additionally analyses will be a option. Soil will be soil will be transported soil may be disposed in characteristically during the RI, the soil accepted for disposal at

The extent of soil analyses, amount of soil backfill required, and backfill.

Present worth cost \$3,740,838 to

Alternative 7 - Monitoring/Excavation of and Off/site Disposal Alternative 7 combines response action for removal and disposal Under this alternative, stream surface water, to provide a method of

conditions. Groundwater samples will be collected from six of that may foul the smaller (second) the seven RI monitoring wells and from three surface water (A precipitation system may also be needed and sediment sampling locations (from the unnamed creek). system to remove silt or other larger The routines for sampling and analyses will be the same as in manganese, and chromium.) The second of unacceptable contaminant migration, and (2) allow for a beryllium to below 4 ug/L. better understanding of the natural attenuation rates.

submicron filtration cartridge will pass Within the Site, all surface soil and the fill material (located adsorption unit. The carbon adsorption unit east of the lagoon) will be excavated, contained and disposed naphthalene, and 2-off-site. With this option, surface soils within the site adsorption unit will hold boundaries and at pipeline location P5 (5 ft by 5 ft) will be of carbon. The activated carbon system excavated to 2 ft depth. Approximately 5,000 yd³ of surface groundwater characteristics and extraction rate soil would require excavation. The surface area of fill material require carbon replacement every is approximately 1,800 yd² with the fill extending to an carbon will be sent off-site for average of approximately 10 ft. These soils total disposal. The effluent from the carbon system approximately 6,000 yd³ that would require excavation. The pipe to the unnamed creek. excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not treatment unit will be located on the site characteristically hazardous. Based on information gained foundation with a protective overhead during the RI, the soil will pass TC criteria and may be to protect the units. accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil. groundwater treatment is based on the size of

pumping and treatment flow rates, Under Alternative 7, the existing lagoon would be backfilled efficiency. The extent of contaminants in and the entire Site will be graded. The grading work at the to be localized because the RI data Site will involve the use of heavy equipment (such as dozers, existence of a significant plume. The loaders, scrapers, and compactors) to spread and compact loose flow rates are 5 gpm. For estimation soil and modify the surface gradient. Grading the Site will that water treatment would continue for

the larger particulate filtration cartridge. prior the filtration particles, i.e., iron, will remove the

The effluent from the through a carbon will remove the benzene, methylnaphthalene. The approximately 180 lbs. sized for the from MW4S and MW5S will 60 days. The removed regeneration or will be discharged via a

The entire water property. A concrete shed will be constructed

The duration of the contaminated plume, and extraction groundwater is expected did not indicate the plumping and treatment purposes, it is assumed

control surface runoff and reduce erosion. Grass seeding will samples will be collected monthly from the be used to grow grass within the Site. the treatment units to periodically The estimated present worth costs for Alternative 7 range from standards are being met. Samples will be a low of \$934,429 to a high of \$2,002,775, with a mid-point PNAs, beryllium, chromium, and of \$1,468,602. years, an evaluation will be conducted

treatment is necessary. After treatment Alternative 8 - Groundwater Pumping and groundwater, stream surface water, and Treatment/Excavation of Site Surface Soils and Fill Area monitoring program similar to Alternative 5 and Off-site Disposal Prior to treatment, each well will be sampled

one time to confirm the presence of the Alternative 8 combines the removal and treatment general concentrations. response action for groundwater and a second combined removal and disposal general response action for surface soil. surface soil and the fill material (located Under this alternative groundwater will be pumped from be excavated, contained and disposed monitoring wells that will be determined during the remedial option, surface soils within the site design. For cost and design estimation purposes, MW4S and pipeline location P5 (5 ft by 5 ft) will be MW5S have been initially chosen as the extraction wells Approximately 5,000 yd³ of surface These wells will be pumped at a combined rate of excavation. The Fill area is approximately approximately 5 gallons/minute. The contaminants of concern extends to an average of approximately 10 include benzene, chromium VI, manganese, naphthalene, 2- approximately 6,000 yd³ would require methylnaphthalene, and beryllium. To remove beryllium, a excavated soil will be contained for disposal. dual filtration cartridge system will be used. The first in a Subtitle D landfill if the soil is cartridge will be a 3 micron filter. This cartridge will remove hazardous. Based on information gained

during the RI, the soil will pass TC criteria and will be chemical-specific ARARs including MCLs, accepted to an off-site solid waste landfill. The excavated of organic contaminants of concern in areas would then be backfilled with natural soil. decrease over time (about 5 years) through

five years. Water influent and effluent of verify that treatment analyzed for benzene, manganese. After five to determine if further has discontinued, a stream sediment will be initiated. and analyzed at least COCs and their

Within the Site, all east of the lagoon) will off-site. With this boundaries and at excavated to 2 ft depth. soil would require 1,800 yd². The fill ft. Therefore excavation. The The soil may be disposed not characteristically

immediately meet but the concentrations groundwater will

will be in compliance with chemical Under this alternative the existing lagoon will be backfilled and metals would tend to persist, the entire Site will be graded. The grading work at the Site groundwater use restrictions would prevent will involve the use of heavy equipment (such as dozers, warning of contaminant migration, as yet loaders, scrapers, and compactors) to spread and compact loose pump and treat alternatives would soil and modify the surface gradient. Grading the Site will sooner than non-pump and treat control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the Site.

specific ARARs, alternatives 3 through 8 The range of present worth costs for Alternative 8 range from for 1) abandonment of wells in the a low of \$4,432,074 to \$9,497,158, with a mid-point of 2) the SC Groundwater Use Act for \$6,964,616. the South Carolina Stormwater

disturbance. No location specific ARARs for the Site.

COMPARATIVE ANALYSIS OF ALTERNATIVES

EPA has established criteria for use in comparing the advantages/disadvantages of each alternative. The alternatives worth cost which includes the are evaluated against one another by using the nine criteria on operation and maintenance cost for each the following table. The nine evaluation criteria fall into the presented within the explanation of the groups: threshold criteria, primary balancing criteria, and detail is provided in the Feasibility Study, modifying criteria. Administrative Record.

The following discussion compares the various alternative to the criteria.

an alternative is based on technical

administrative feasibility and the availability of Overall Protection of Human Health and the Environment All components of each alternative are

administratively feasible. The design and Relative to groundwater concerns, the alternatives without caps with synthetic materials is commonly groundwater pumping and treatment (Alternatives 1, 2, 3, 5, 7) and removal would be difficult and

natural attenuation and specific ARARs. While monitoring and exposure and provide undetected. Groundwater provide compliance alternatives.

Relative to action-comply with requirements SC Groundwater Use Act, Well Development, and 3) Regulations for soil have been identified

Cost

A summary of the present capital as well as the of the alternatives is alternative. Greater which is located in the

Implementability

The implementability of feasibility, services and materials. both technically and construction of soil done. Soil excavation

will have decreases in the concentrations of organic with significant administrative contaminants through natural attenuation. While metals would commonly done. Necessary technology, tend to persist, migration of metals was not observed during are all readily available. Pump and the RI. Alternatives with pump and treatment of groundwater commonly installed at Superfund Sites, (Alternatives 4, 6) would enhance the speed of the reduction term requirements of these remedies, of organic contaminants. Groundwater monitoring and use not been fully determined at many other restrictions of all alternatives except the no action alternative would preclude exposure to the groundwater and provide early warning of unacceptable contaminant migration.

Relative to surface soil, alternatives 1 and 2 do not reduce Proposed Plan and the upcoming comment risks to ecological receptors. All other alternatives eliminate input from the public during the remedy risk to area biota.

Community acceptance of the preferred

evaluated after the public comment: period
Compliance with Applicable or Relevant and Appropriate
the Record of Decision for the Site.
Requirements (ARARs)

All non pump and treat groundwater alternatives will not

would require compliance requirements, but it is services, and materials treat remedies are although due to the long their effectiveness has sites.

Community Acceptance

The purpose of this period is to encourage selection process.

alternative will be

and will be described in

CRITERIA FOR EVALUATING REMEDIAL ALTERNATIVES

In selecting a preferred cleanup alternative, EPA uses the following criteria to evaluate each of the alternatives developed in the Feasibility Study (FS). The first two criteria are essential and must be met before an alternative is considered further. The next five are used to further evaluate all options that meet the first two criteria. The final two criteria are used to further evaluate EPA's proposed plan after the public comment period has ended and comments from the community and the State have been received. All nine criteria are explained in more

detail here.

- Overall Protection of Human Health and the Environment - Assesses degree to which alternative eliminates, reduces, or controls health and environmental threats through treatment, engineering methods, or institutional controls.
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - Assesses compliance with Federal/State requirements.
- Cost - Weighing of benefits of a remedy against the cost of implementation.
- Implementability - Refers to the technical feasibility and administrative case of a remedy.
- Short-Term Effectiveness - Length of time, for remedy to achieve protection and potential impact of construction and implementation of the remedy.
- Long-Term Effectiveness and Performance - Degree to which a remedy can maintain protection of health and environment once cleanup goals have been met.
- Reduction of Toxicity, Mobility, or Volume Through Treatment - Refers to expected performance of the treatment technologies to lessen harmful nature, movement, or amount of contaminants.
- State Acceptance - Consideration of State's opinion of the preferred alternatives.
- Community Acceptance -- Consideration of public comments on the Proposed Plan.

Short Term Effectiveness

During the implementation of all the alternatives, both on-site workers and people surrounding the Site will be protected from possible impacts caused by construction activities. Risks from cap installation or soil excavation and removal would be addressed in health and safety plans. There is no risk to the environmental receptors from implementation of any remedy,

although habitats would be disrupted during installation activities. Community risks from construction truck traffic would be short term and safety could be insured by additional signage and traffic control. Installation of a cap would be immediately effective in reducing leaching from soils into the groundwater.

Long-Term Effectiveness and Permanence

All of the alternatives under consideration by EPA in this Proposed Plan were evaluated for this criteria under each of its components consisting of 1) permanence, 2) magnitude of residual risk, 3) adequacy and reliability of controls, 4) need for periodic review, and 5) certainty of success. Relative to permanence and magnitude of residual risk, Alternatives 1, 2, 3, 5, and 7 only reduce risk in groundwater after natural attenuation processes are complete. Pump and treat Alternatives 4, 6, and 8 will reduce risks from groundwater more quickly. Alternatives 1 and 2 do not reduce ecological risks while all other alternatives do. Adequacy and reliability of controls for all alternatives are generally good if institutional controls (such as Alternative 2) are enforced. All alternatives involving regular monitoring will require periodic review as will alternatives involving capping the Site. Alternatives involving excavation and soil replacement will not require periodic review. All alternatives have approximately the same certainty of success with the pump and treat alternatives having the ability to meet Remedial Action Objectives more quickly.

Reduction of Toxicity, Mobility, and Volume

This criteria was evaluated for each of its components consisting of 1) treatment used, 2) reduction of toxicity, mobility, or volume, 3) type and quantity of residuals remaining after treatment, and 4) irreversibility of treatment. Only pump and treat alternatives involve treatment and are considered irreversible. Such treatment will generate residuals which will require off-site disposal Alternatives involving soil excavation and removal will reduce the toxicity, mobility, and volume by removal of the contaminated soils. Capping alternatives will reduce the mobility of the contaminants, while soil excavation remedies are considered irreversible.

State Acceptance

The State of South Carolina's Department of Health and Environmental Control was consulted during the drafting of this Proposed Plan. They are in support of the Alternative selected in this Proposed Plan.

EPA'S PREFERRED ALTERNATIVE

who are interested in a

TAG may contact Ms. Cynthia Peurifoy

In summary, based on the information available at this time, EPA is proposing Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-10-9 Site Cap and An official compilation of information that is Deed Restrictions, as the proposed remedy for the Beaunit the status of Superfund decisions. The record is Site. The only modification to Alternative 3 as described information repository to allow public access to the material. earlier in this fact sheet and in the Feasibility Study is the design specifications and construction materials for the Cap. and Appropriate Requirements (ARARs):

Both EPA and SCDHEC concur that the cap should be be met by a response action selected by EPA as a designed to meet a specification of 10-9 permeability, rather "Applicable" requirements are those mandated under one or than the 10-5 permeability contained in the alternative as laws. "Relevant and appropriate" requirements are developed in the Feasibility Study. The change was based on necessarily required, EPA judges to be appropriate modeling the Site with the Sommers model, commonly used to particular case.

predict effectiveness in caps to prevent leaching from contaminated soils. EPA and SCDHEC feel the higher degree Assessment: An assessment which provides an evaluation of impermeability of a cap built to 10-9 specification would human health and the environment in the absence of insure that the RGO's would be met in the groundwater. The exact details of the construction of the cap will be determined during the Remedial Design. plant life of a given region.

Several assumptions were made during EPA/SCDHEC change Environmental, Response, Compensation and in design specifications for the cap. Utilizing cost comparisons A Federal law passed in 1980 and modified in to other recent 10-9 cap designs for sites in this area capital Amendments and Reauthorization Act (SARA), costs are estimated to be \$32,000 additional for the site investigate and clean up abandoned or uncontrolled remedy. Several modeling runs of caps were performed on RACER software (Remedial Action Cost Engineering and Requirements System, Dept. of Air Force, 1993). From those efforts, it is believed that the capital cost of the Modified (COC's): Contaminants, identified during Alternative 3 Site Cap would be between \$212,000 to risk assessments, that pose a potential risk to human \$220,000, below the \$225,000 high range of the Feasibility environment because of their toxicity and potential routes of Study estimate of capital costs for the 10-5 cap. EPA believes that a conservative estimate of the total costs for the Selected Remedy, the modified Alternative 3, \$580,882.

at 1-800-435-9233.

GLOSSARY

Administrative Record:
considered important to
placed in the

Applicable or Relevant
Requirements which must
site remedy.

more Federal or State
those which, while not
for use in that

Baseline Risk
of the potential risk to
remedial action.

Biota: The animal and

Comprehensive,
Liability Act (CERCLA):
1986 by the Superfund
known as Superfund, to
hazardous waste sites.
waste sites.

Contaminants of Concern
site investigations and
health and the
exposure.

Exposure Route: Path

for contaminants to reach people either working or

This alternative represents the best balance among the criteria used to evaluate remedies. The modified Alternative 3 is found beneath the earth's surface that fills the pores believed to be protective of human health and the environment, as sand, soil, or gravel.

would attain ARARs, would be cost effective, and would utilize permanent solutions and alternative treatment (HRS): A scoring system used by EPA and technologies or resource technologies to the maximum extent relative risks to public health and the environment practicable.

threatened releases of hazardous substances. An HRS

based on actual or potential release of hazardous

Based on comments received from the public during the air, soils, surface water or groundwater. This score upcoming comment period, EPA, in consultation with to decide if a hazardous waste site should be placed SCDHEC, may later further modify the preferred alternative or Priorities List.

select another remedial alternative presented in this Proposed Plan.

A library or other location where information

Site is placed for public access.

TECHNICAL ASSISTANCE GRANTS ARE AVAILABLE

at which liquids pass through soil or other

To assist communities in interpreting the technical finding at direction.

Superfund Sites, communities may apply for Technical Assistance Grants of up to \$50,000. Congress and EPA have (PNA's) - also know as Polynuclear established requirements for the use of this grant. Citizens (PAH's): A class of organic compounds whose

joined rings of carbon atoms. PNAs/PAHs are often

treating operations such as creosote treatment.

(ROD): A public document describing EPA's

of a Superfund cleanup alternative.

Investigation/Feasibility Study (RI/FS): A two part study of

that supports the selection of a remedial action for the

or the RI, identifying that type and extent of

residing near a site.

Groundwater: Water

between materials such

Hazard Ranking System

the states to evaluate

from releases or

score is calculated

substances through the

is a primary factor used

on the National

Information Repository:

related to a Superfund

Permeability: The rate

materials in a specified

Polynuclear Aromatics

Aromatic Hydrocarbons

structure consists of

associated with wood-

Record of Decision

rationale for selection

Remedial

hazardous waste site

site. The first part,

contamination. The

second part, or the FS, identifies and evaluates alternatives for
addressing site contamination, based on the results of the RI.

APPENDIX D

PUBLIC NOTICE OF COMMENT PERIOD

Published November 6, 1994, Greenville News

Published November 9, 1994, Golden Strip Times/Tribune Times

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV
INVITES PUBLIC COMMENT ON THE PROPOSED CLEANUP PLAN FOR THE
BEAUNIT CIRCULAR KNIT A DYEING SUPERFUND SITE,
FOUNTAIN INN, GREENVILLE COUNTY, SOUTH CAROLINA

The U.S. Environmental Protection Agency is inviting public comment on the Proposed Plan for cleanup of the Beaunit Circular Knit & Dyeing Superfund Site. The Remedial Investigation and Feasibility Study for the site have been completed. The Remedial Investigation determined the nature and extent of contamination at the site. The Feasibility Study evaluated alternatives for addressing surface soil and groundwater contamination at the site, the principal threats posed by the site.

EPA evaluated eight alternatives that were considered in the Feasibility Study. The costs shown in parentheses below represent the midpoint of the low and high present worth cost estimates for each alternative. The following alternatives were considered:

Alternative 1:	No Action (\$5439)
Alternative 2:	Groundwater, Surface Water, and Sediment Monitoring/Groundwater Use Restrictions/Deed Restrictions

	(\$276,887)
Alternative 3:	Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Capping of Site and Deed Restrictions (\$580,822)
Alternative 4:	Groundwater Pumping and Treatment/Grading & Drainage Control-Capping of Site and Deed Restrictions (\$6,042,662)
Alternative 5:	Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots"/Off-site Disposal and Deed Restrictions (\$806,934)
Alternative 6:	Groundwater Pumping and Treatment/Excavation of "Hot Spots", Off-Site Disposal and Deed Restrictions (\$6,302,948)
Alternative 7:	Groundwater, Surface Water and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal (\$1,468,602)
Alternative 8:	Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal (\$6,964,616)

EPA is proposing Implementation of Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading and Drainage Control-Capping of Site and Deed Restrictions. Under the alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. A cap will be placed over the entire area within the fence. EPA is proposes a change to the design specifications for Alternative 3, as written in the Feasibility Study. EPA and SCDHEC propose that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-5 permeability as contained in the alternative as developed in the Feasibility Study. The design of a 10-9 cap will probably require synthetic materials in addition to soil and clay. EPA and SCDHEC believe that the higher degree of impermeability would insure that Remedial Goal Options for groundwater would be met. EPA believes that the proposed remedy will be protective of human health and the environment, meet applicable or relevant and appropriate requirements, be effective in the long-term, reduce contaminant, mobility, be easy to implement, and will be cost effective.

The Agency is holding a 30 day comment period, which begins on Monday, November 7, 1994, and ends on Wednesday, December 7, 1994. Upon receipt of a timely request, the comment period can be extended for an additional 30 days. Written comments, which must be postmarked no later than December 7, 1994, should be sent to:

Mr. Steven Sandler, Remedial Project Manager
of Cynthia Peurifoy, Community Relations Coordinator
North Superfund Remedial Branch
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E., Atlanta, GA 30365

EPA has scheduled a public meeting to present the proposed plan and to answer questions regarding the Remedial Investigation, Feasibility Study and other documentation contained in the Administrative Record. The meeting also provides the public an opportunity to submit oral and written comments on the proposed cleanup plan and the other alternatives considered. The meeting will be:

Date: Monday, November 14, 1994
Time: 7:00 p.m.
Place: FOUNTAIN INN ACTIVITY CENTER
200 N. Main Street, Fountain Inn, South Carolina

Copies of the proposed plan, as well as the administrative record for the site, are available for review at the site information repository, which is in the Fountain Inn Branch Library, 400 North Main Street Fountain Inn, SC, 803-862-2576. These documents are also available for review at the EPA Records Center, 345 Courtland Street, N.E., Atlanta, GA 30365, 404-347-0506.

For additional information, or to be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, at 1-800-435-9233, or 404/347-7791, x4102.

Published November 27, 1994, Greenville News

Published November 30, 1994, Golden Strip Times/Tribune Times

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV
INVITES PUBLIC COMMENT ON THE PROPOSED CLEANUP PLAN FOR THE
BEAUNIT CIRCULAR KNIT A DYEING SUPERFUND SITE,
FOUNTAIN INN, GREENVILLE COUNTY, SOUTH CAROLINA

The U.S. Environmental Protection Agency has extended the public comment period for the Proposed Plan for the Beaunit Circular Knit and Dyeing Superfund Site. The comment period which opened on November 7, and was scheduled to close on December 7, will close on January 13, 1995. EPA continues to inviting public comment on the Proposed Plan for cleanup of the Beaunit Circular Knit & Dyeing Superfund Site. EPA held a public meeting on November 14, 1994 to present the proposed plan and to receive public input.

EPA and the South Carolina Department of Health and Environmental Control, evaluated eight alternatives that were considered in the Feasibility Study conducted for the site. The costs shown in parentheses below represent the midpoint of the low and high present worth cost estimates for each alternative. The following alternatives were considered:

Alternative 1: No Action (\$5439)
Alternative 2: Groundwater, Surface Water, and Sediment Monitoring/Groundwater Use Restrictions/Deed Restrictions (\$276,887)

Alternative 3: Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Capping of Site and Deed Restrictions (\$580,822)

Alternative 4: Groundwater Pumping and Treatment/Grading & Drainage Control-Capping of Site and Deed Restrictions (\$6,042,662)

Alternative 5: Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots"/Off-site Disposal and Deed Restrictions (\$806,934)

Alternative 6: Groundwater Pumping and Treatment/Excavation of "Hot Spots", Off-Site Disposal and Deed Restrictions (\$6,302,948)

Alternative 7: Groundwater, Surface Water and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal (\$1,468,602)

Alternative 8: Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal (\$6,964,616)

EPA is proposing Implementation of Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading and Drainage Control-Capping of Site and Deed Restrictions. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. A cap will be placed over the entire area within the fence. EPA is proposing a change to the design specifications for Alternative 3, as written in the Feasibility Study. EPA and SCDHEC propose that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-6 permeability as contained in the alternative as developed in the Feasibility Study. The design of a 10-9 cap will probably require synthetic materials in addition to soil and clay. EPA and SCDHEC believe that the higher degree of impermeability would insure that Remedial Goal Options for groundwater would be met. EPA believes that the proposed remedy will be protective of human health and the environment, meet applicable or relevant and appropriate requirements, be effective in the long-term, reduce contaminant mobility, be easy to implement, and will be cost effective.

Written comments, which must be postmarked no later than January 13, 1995, should be sent to:

Mr. Steven Sandler, Remedial Project Manager
of Cynthia Peurifoy, Community Relations Coordinator
North Superfund Remedial Branch
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E., Atlanta, GA 30365

Copies of the proposed plan, as well as the administrative record for the site, are available for review at the site information repository, which is in the Fountain Inn Branch Library, 400 North Main Street Fountain Inn, SC, 803-862-2576. These documents are also available

for review at the EPA Records Center, 345 Courtland Street, N.E., Atlanta, GA 30365, 404-347-0506.

For additional information, or to be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, at 1-800-435-9233, or 404/347-7791, x4102.

APPENDIX E

TRANSCRIPT OF THE PROPOSED PLAN PUBLIC MEETING

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION IV

ATLANTA, GEORGIA

PUBLIC HEARING

NOVEMBER 14, 1994 @ 7:00 P.M.

BEAUNIT CIRCULAR KNIT & DYEING SUPERFUND SITE

FOUNTAIN INN, SOUTH CAROLINA

Deborah Garrison
Court Reporter
245-D East Broad Street
Greenville, S.C. 29601
(803) 244-0973

1 BY CYNTHIA PEURIFOY:

2 Good evening. My name is Cynthia Peurifoy and I'm
3 the Community Relations Coordinator with the South
4 Carolina section of the Superfund Program of EPA out

5 of Atlanta, Georgia.

6 I welcome you here tonight to hear the proposed plan
7 concerning the Beaunit Circular Knit & Dyeing Super-
8 fund Site.

9 Before we get started, I want to make some introduc-
10 tions to you.

11 First of all, I would like to introduce to you Ste-
12 ven Sandler. He is the Remedial Project Manager of
13 the site for EPA.

14 I would also like to introduce Jan Rogers, who is
15 managing coordinator for EPA, South Carolina sec-
16 tion.

17 We have some colleagues of ours from the South Caro-
18 lina Department of Health and Environmental Control
19 with us tonight. They are Craig Marriner and Jim
20 Bowman.

21 Before we get started, I would also like to cover a
22 little bit with you about the Superfund's Community
23 Relations Program. I know that some of you are
24 familiar with the community interviews that we did
25 in preparation for our work on the site. We do have

1 a community relations plan outlined that we felt we
2 should do in order to communicate with the community
3 and keep you informed. And I know that a lot of you
4 got the Fact Sheet that we mailed out that announced

5 our Proposed Plan.

6 I also want to make sure that you have the informa-
7 tion that is at the Fountain Inn Library here in
8 Fountain Inn.

9 We are in the public comment period on this proposed
10 plan. That comment period ends on December 7th.

11 There is a provision for a thirty-day extension of
12 that comment period, if you so desire.

13 I would also like to point your attention to our
14 court reporter tonight, who is Deborah Garrison. I
15 would like to ask that at any time you would like to
16 make a statement or ask a question that you identify
17 yourself and make sure that she can hear you clear-
18 ly, whatever statement that you would make.

19 Finally, I would like to just ask that if at any
20 time we can do anything for you, or answer any ques-
21 tions for you, that you can reach us at our 800-
22 Number, which is on the Fact Sheet. Let us know of
23 anything that we can do to answer questions or to
24 answer any concerns that you have.

25 At this time, I would like to turn the meeting over

1 to Steven Sandler, our Remedial Project Manager.

2 BY MR. SANDLER:

3 Thank you very much, Cynthia. And thank you, too,
4 everyone who came out tonight to listen to what we
5 are going to be proposing for the cleanup of the

6 Beaunit Circular Knit & Dyeing Site.

7 I have a few photographs that I am going to put out
8 on the table, which some of you may wish to take a
9 look at after I make the presentation; because many
10 people may not be familiar with the site, because it
11 is not on a main road and it is not quite on the
12 road.

13 The Site is located off of Valley View Road. I have
14 a picture here and you can see some tire tracks, and
15 that shows where the entrance to the Site is.

16 I also have some other photographs that show the
17 interior of the site, (placing on table for public
18 viewing).

19 Briefly, I will go through a little bit of the his-
20 tory of the Site, the regulatory history of the
21 Site; some of the Site features; what we did during
22 the investigation of the Site; and the development
23 of the alternatives to clean up the Site; and what
24 the Agency selected, in conjunction without coun-
25 terparts at the South Carolina Department of Health

1 & Environmental Control; and give you an indication
2 of some of the upcoming events in the cleanup of
3 this Site.

4 Last, and certainly not least, we will have plenty
5 of time for questions and answers at the conclusion
6 of the presentation.

7 Just briefly, the site history:

8 In 1951, there was a wastewater treatment plant in
9 the woods off of Valley View Road, some four hundred
10 yards from what is now the Wilson Sporting Goods
11 plant.

12 In 1952, the wastewater treatment plant was put into
13 operation. It had a capacity then of 300,000 gal-
14 lons per day.

15 In 1953, the capacity was increased.

16 In 1977, the plant was shut down and the operation
17 of the wastewater treatment plant, which included a
18 wastewater lagoon, ended.

19 And sometime inbetween 1977 and 1988, all discharge
20 to the lagoon from the plant stopped. Even though
21 the lagoon was not used for sewage treatment opera-
22 tions, there was a pipeline that connected the cur-
23 rent Wilson Sporting Goods plant to the lagoon and
24 there were some materials that were discharged into
25 the lagoon.

1 Inbetween 1979 and 1980 the wastewater treatment
2 plant, the structures above the ground, were de-
3 stroyed and for the most part were bulldozed into
4 the lagoon. There was some concern then that the
5 lagoon represented an unsafe condition. As it was
6 explained to the parties who were involved at this
7 time when the lagoon was filled in, it was so that

8 it would not pose so much of a hazard.

9 A number of governmental agencies have been involved
10 in this site for a period of time. And like any
11 history, there are some certain variations in the
12 years. I have seen one report saying that as early
13 as the early '60s that some citizens had complained
14 about an odor problem. But there were some com-
15 plaints in the early 70's about stream discolor-
16 ation. I should add that the lagoon has a pipeline
17 that connects it with the plant and it also had a
18 discharge pipe where, after the sewage had been
19 treated, it would be discharged to an unnamed stream
20 that eventually went into another stream called
21 Howard's Branch.

22 In 1973, the state agency DHEC had a public hearing
23 on the violations.

24 And in 1985, they did a site investigation and sam-
25 pled the site. I should add that there were very,

1 very few samples that were taken in 1985. But the
2 site was still ranked according to a Hazardous Rank-
3 ing score and proposed for listing on the National
4 Priorities List, which is the list of sites which
5 enable facilities to be studied under the CERCLA
6 law.

7 I will apologize, as I do in every single meeting,
8 for inadvertently using many acronyms and abbrevia-

9 tions. "CERCLA" is the formal name for what we all
10 call "Superfund". The law has a fund of money which
11 provides for the study and cleanup of sites if no
12 potentially responsible parties (RPRs) are found.
13 Or if they are found, it will attempt to seek cost
14 recovery in negotiation with potentially responsible
15 parties to get the site cleaned up.

16 We have five companies that at various points in
17 time either directly owned or operated the plant and
18 the wastewater treatment lagoon, or later bought a
19 company that operated the plant and the wastewater
20 lagoon. Those five PRP's, as we call them, are El
21 Paso Natural Gas, Kaiser Corporation, Pepsi Inc.,
22 Wilson Sporting Goods and Continental Assurance.
23 I am getting a little bit ahead of myself, but as
24 you can see, in 1990 the site was listed on the
25 National Priorities List as a Superfund site.

1 And by 1992 all the PRP's and EPA successfully nego-
2 tiated and signed an AOC, which stands for an Ad-
3 ministrative Order Under Consent. That is a con-
4 tractual agreement between the PRP's and EPA which
5 outlines, in this case, an agreement where the PRP's
6 agree to study the site and propose solutions to
7 clean it up with EPA and DHEC oversight.

8 (Displaying Figure 1.1 map via overhead projec-
9 tor/indicating), this is where the Wilson Sporting

10 Goods plant is. And this little square is where the
11 site is. You can see the center of Fountain Inn is
12 over here (indicating lower right of Figure 1.1).
13 Just to mention some of the characteristics of the
14 site, it is 1.3 acres. This is the former waste-
15 water plant and lagoon area.
16 This is what it looks like right now, with the la-
17 goon partially filled in. As I said, I brought some
18 photographs so that you can take a look at it.
19 There is a large amount of manufacturing debris from
20 the manufacturer of tennis balls, which is non-
21 hazardous but is nevertheless piled up in the area.
22 You see a lot of pieces of a synthetic material,
23 like Swiss cheese, so to speak, with circular cut-
24 out's taken out of it, which are the parts that are
25 used in the manufacture of tennis balls.

9
1 Because the area was used as a sewage treatment
2 lagoon, some of the exact site features and the
3 location of things are a bit uncertain as far as the
4 exact dimensions. But we generally know where they
5 are. As I said earlier, We will show you a blow-up
6 of the site to illustrate that.
7 The site had a pipeline going in from the factory
8 and it also had a pipeline going out.
9 The area is currently fenced, locked, and it is

10 posted as a Superfund site.

11 The nearest residence is the Valley View Apartments
12 and they are some one hundred yards northeast.

13 There is runoff on the site, generally to the north-
14 west, on the surface and also in the groundwater.

15 The entire area served by municipal water and sew-
16 age.

17 We had conducted, as part of the remedial investiga-
18 tion, a feasibility study by a survey of the area
19 which does not show any signs of animal life. But
20 within the fenced area are aquatic life and are
21 adjacent to the lagoon. We did not have individual
22 stations there for a long period of time. This is a
23 habitat for a number of species and that fact played
24 a part in our decision as to what to do in cleaning
25 up the site.

1 (Displaying Figure 1.2 map on overhead projector).

2 This is a copy of a map which was done for both
3 remedial investigation and then the feasibility
4 study. To re-emphasize what Cynthia had indicated,
5 in the Public Library you will find a vast number of
6 documents regarding the work that has gone on on
7 this site, including an Administrative Index or an
8 Administrative Record which has all of the documents
9 which were used to formulate the decision on how to
10 clean up the site. That includes all correspondence

11 to myself from people doing the study, any comments
12 that I received from other EPA and State parties,
13 and a review of the documents. So all of the items
14 that help make the decision are available for public
15 scrutiny.

16 Back to the site itself, the lagoon is only a frag-
17 ment of the size that it once was. You see that
18 when the lagoon was entirely filled in that it was
19 approximately this size (indicating broken lines
20 forming square on map.) Now it is much smaller
21 (indicating present size on map.)

22 This is the pipe exit of the lagoon area and there
23 were a number of sewage treatment plant operations.
24 There was a clarifier (indicating), an aero accelera-
25 tor (indicating) and there were some valves. Then

1 this was foam (sic) material -- or rather the sludge
2 drying beds. Excuse me. It's hard to read when
3 you're staring at the light.

4 To explain, you may see on the sign-in list some
5 names of entities or when you go and look at the Ad-
6 ministrative Record you will see names of the con-
7 sulting firms that you should be aware of.

8 When the PRP's signed the EPA Administrative Order
9 Under Consent they, in turn, retained a consulting
10 firm by the name of Parsons Engineering Science.
11 They did the remedial investigation and the feasi-

12 bility study, according to an approved workplan that
13 EPA reviewed and negotiated with the PRP's.
14 EPA retains the -- we retain certain
15 responsibilities when a remedial investigation and
16 feasibility study are done. One of those responsi-
17 bilities is community relations, which is why some
18 of you saw Cynthia and I as we came to certain in-
19 dividuals' homes and we did interviews. We went
20 through the neighborhoods around the plant. We also
21 met with a number of people in the Fountain Inn
22 government. All of those things came into play in
23 our decision.
24 We also retain responsibility for doing a very im-
25 portant part of the study, and that is called the

1 Baseline Risk Assessment. EPA retained and later
2 seeks reimbursement for the cost of doing that.
3 That document was prepared by Roy F. Weston and,
4 lastly, -- we have a number of sites and it is dif-
5 ficult to do all of the oversight to make sure that
6 the samples have been collected properly. I can't
7 do all of that work myself, nor would it be cost-
8 effective to do it. So we retained another consult-
9 ing firm, EPA, which was in this case was Camp
10 Dresser & McKee (CDM) to do the oversight for us.
11 They also reviewed documents. So when you review
12 the documents you may see many names with Engineer-

13 ing Science or Weston or McKee on it and I just
14 wanted to point that out. All of these individuals
15 were very active in doing the studies.
16 What was done with the study? (Changing overhead
17 slides). First of all, with most Superfund sites,
18 you end up finding out that groundwater may or may
19 not be contaminated. And you also have soil that
20 also may or may not be contaminated. We refer to
21 these things as "media". There are surface soils,
22 there's subsurface soils, there's sediment along the
23 banks of the lagoon and the banks of area streams.
24 And there is also the air which is sometimes moni-
25 tored, if that is suggested as being a concern.

1 In the case of this site, there were seven monitor-
2 ing wells installed. There were three upgradient,
3 or above, or in the opposite direction of the
4 groundwater flow. Those can give you an indication
5 of what the background conditions are. Quite often
6 you find out that the background conditions show
7 some contamination; so there is an contamination in
8 the area which may not be from the site itself. It
9 also gives you a basis on which to judge how signif-
10 icant the contamination might be.

11 We also installed four downgradient wells. Wells
12 were also installed -- and some of these wells were
13 at different depths, because this site, as many

14 sites, has an upper and lower aquifer and you want
15 to see if any contamination has potentially reached
16 the lower aquifer.

17 As you can read for yourself, as far as surface soil
18 samples, we collected at twenty-four locations with
19 three background locations.

20 As I said, there was an incoming pipeline going into
21 the lagoon and an effluent pipeline. It was sampled
22 along the pipelines, both going in and coming out.
23 There were also soil samples, subsurface soil sam-
24 ples, taken in that sludge drying bed. This was
25 used for wastewater -- a byproduct of wastewater

1 treatment is the production of sludge. The residue
2 that settles out of the sewage, it has to be dis-
3 posed of. Quite often in the past, and in the pres-
4 ent, at a number of sewage treatment plants, you put
5 it out in areas to dry. It is compressed. Like
6 anything, once you get the water out of it, it is
7 far less bulkier, easier to handle and to properly
8 dispose of.

9 Within the fenced in area, there were also other
10 areas -- because there was a minor breach in the
11 wall of the lagoon and there were some leakage of
12 materials in the past. The lagoon wall had been
13 fixed in the past and there was some indication of
14 leakage of materials. So that had been sampled.

15 The next thing on the overhead, which is very impor-
16 tant and which we want to emphasize to the public,
17 is the fact that although EPA and PRP's do an awful
18 lot of work, how would we know that the results are
19 valid? That is the point that I put on this slide,
20 collection and analysis, quality control.

21 We have site samples, split samples and they test
22 part and we test part to make sure that the results
23 match. We also require an extensive amount of docu-
24 mentation from laboratories that they use, as well
25 as we have the responsibility to approve the labora-

1 tories that they use and to make sure that the re-
2 sults are valid and that there is something we can
3 make a decision on.

4 The next item that was done under the RI was survey-
5 ing and mapping, so that we had accurate maps so
6 that we would know where samples were taken. As I
7 have already mentioned, we did our own survey and
8 then they did it. It was fed into the risk assess-
9 ment for about a half a mile radius around the Site.
10 The area around the site was a number of different
11 habitats: fields, wooded areas. There was a poten-
12 tial for a wide variety of animal life in the area,
13 which we were concerned with. As I said, Engineer-
14 ing Science worked with the PRP's and, with over-
15 sight conducted by EPA and DHEC, and also Camp

16 Dresser & McKee, our oversight contractor.

17 On this map we have -- this is reproduced in the
18 copy of the Proposed Plan, and we have extra copies
19 of the proposed plan.

20 Just to point out some of the monitoring well loca-
21 tions. As I said, the direction of the flow tends
22 to be to the northwest, and here is the lagoon area
23 here (indicating). We had a shallow monitoring well
24 right here and a deep monitoring well here. We had
25 a shallow monitoring well here. We had another

1 swallow monitoring well right over here (indicat-
2 ing). And we had a number of ones downgradient.
3 These are some of the upgradient ones, (indicating).
4 And we had one over here. We had one over here and
5 over here (indicating). I believe that's it. Some
6 of the ones that I indicated had both shallow and --
7 there were seven wells, I think, here.

8 And what did we find out from all of this? We found
9 out a number of things. When you start a project,
10 you form a conceptual model of what you think the
11 site is like and we found out a number of things
12 were not what we thought that they would be. One,
13 we thought that the bedrock would be lot closer to
14 the surface and that ended up not being the case.
15 We thought that the bedrock might only be twenty or
16 twenty-five, thirty feet down. But as it turns out,

17 we got a phone call the first day that drilling was
18 going on out on the site and they were down a hun-
19 dred feet and hadn't hit anything. Bedrock gener-
20 ally is sixty to hundred feet. What difference does
21 this make? Quite often if you have bedrock closer
22 to the surface that has been fractured, you can have
23 contaminants that reach and travel across the rock
24 to another location, or you could also have frac-
25 tures which may make it very difficult.

1 Another thing that we found out about -- as I said,
2 this site was put on the National Priorities List
3 based on a very, very few samples that were collect-
4 ed. It was thought that of all the organic compo-
5 nents that we find at a lot of sites wouldn't be a
6 concern at this site. If you look at point number
7 four on page three of the Proposed Plan it talks
8 about contaminants. And I don't want to alarm any-
9 one but these go into a very laborious detailed
10 process for anything that might be a problem because
11 you have a detection of it or we think that it may
12 be detected it is also retained as a contaminant.
13 It is also retained because they are more signifi-
14 cant things that cause problems.

15 If you found -- the key word that I want you to keep
16 in mind is "potential." There were a number of
17 things that were potential that were found not to be

18 problems at this site.

19 As you can see, lead and cadmium was detected earli-
20 er by DHEC, as well as PCBs, but were not found to
21 be significant enough to be a concern.

22 One contaminant, Beryllium, was detected in one
23 groundwater sample at 4.5 milligrams per liter. We
24 have a standard, which is called the maximum stan-
25 dard level, of just 4, so it was only slightly above

1 the MC level.

2 And we also had Manganese which also was detected in
3 the sampling from three wells, one of which was a
4 background well. As I have already indicated to
5 you, we sampled the background wells to see if there
6 were already some contaminants in the area. No
7 other metals were found that exceeded the federal
8 drinking water standards.

9 Manganese is mainly a problem in actually washing of
10 clothes because of staining fabrics and plumbing
11 fixtures. And it causes -- it is regarded as gener-
12 ally a secondary standard of the Drinking Water
13 Act.

14 One of the other key findings is that even if you
15 have contamination it is going to -- and this may be
16 a rather complicated notion to follow through, but
17 there are two ways that things can potentially get
18 off the site. That would be surface runoff and

19 infiltration or leachate migration through the
20 soils. There are ways to control these things.
21 The remedy that we selected -- (pause).
22 To go back a second. The RPRs have developed a
23 feasibility study that goes through the formulation
24 of some remedial goals, which are numeric numbers
25 that you want to see achieved after a cleanup. They

1 develop a variety of ways of reaching those remedial
2 goals.

3 This slide depicts the eight alternatives that were
4 developed by the PRP's for this Site. It is EPA's
5 responsibility, in conjunction with the State and
6 citizen input to select an alternative that will be
7 most protective of the human health and the environ-
8 ment. We have some other criteria that we have to
9 match also in selecting an alternative.

10 Here are the eight alternatives:

11 Alternative 1, the first one, is "No Action." Which
12 is a requirement of the law, is that everyone tries
13 to do nothing. We actually require them to cost out
14 and show the effects of doing nothing.

15 The other alternatives -- and I won't go into each
16 individual one, but there are combinations of the
17 different -- different components for treating and
18 dealing with the groundwater, and different compo-
19 nents for treating and dealing with the soil contam-

20 ination.

21 The different type of alternatives that we have
22 developed for the groundwater include doing nothing,
23 nothing or no action, to doing monitoring of ground-
24 water for a period of time, and ultimately leading
25 up to Alternative 8, pumping and treating the

1 groundwater. That is a treatment that has been
2 unfortunately required at a number of other sites.
3 It is very costly, very time-consuming. Admittedly,
4 there is some technical debate as to how effective
5 will it turn out to be.

6 The different types of remedies for dealing with the
7 contamination of the soil involve capping the site
8 so that rain water and surface runoff after the rain
9 will not allow contaminants that do exist in the
10 soil to get into the groundwater. That is what you
11 can see in Alternative 3, the soil cap.

12 Then in Alternative 2 -- the excavation of the mate-
13 rial, which is in Alternative 5 and 6.

14 Alternative 7 would be an off-site disposal.

15 Alternatives 5, 6, 7 and 8 would be an off-site
16 disposal of the material.

17 After a number of meetings in which EPA and DHEC
18 reviewed the feasibility study, we decided on Alter-
19 native 3 as meeting all the criteria required for a
20 Superfund remedy.

21 As you can see on the slide, we did make a modifica-
22 tion from the alternative as it was contained in the
23 feasibility study. In the feasibility study what
24 does this alternative consist of? It consists of a
25 couple of different things.

1 For the groundwater, the surface water and the sedi-
2 ment, it proposes monitoring in the future to make
3 sure that what we found today remains to be the
4 case.

5 What was proposed was six groundwater samplings, two
6 per year for the first two years and then annually
7 after that. Three surface water samples and three
8 sediment samples. Samples from these locations will
9 be collected and analyzed semi-annually for the
10 first two years and annually for three years there-
11 after. So it sets up a continuous program of moni-
12 toring the groundwater, the surface water and the
13 sediments.

14 We also proposed capping the site, grading the site
15 and filling in the lagoon, establishing drainage
16 control and capping the site with the necessary
17 materials. This is where the change is, to ensure a
18 ten to minus nine permeability.

19 I, myself, am not an engineer. Ten to the minus
20 five is the permeability that the PRP's proposed for
21 Alternative 3 in the feasibility study.

22 The ten to the minus nine permeability means that
23 you have coverage that is more impervious and it
24 would be more difficult for the contaminants in the
25 soil to reach the groundwater.

1 To do a cap of the site of a ten to the minus five
2 permeability, you could achieve that with a cover
3 over the site that was composed of soil and clay.
4 That is what was proposed in the feasibility study.
5 To achieve a ten to the minus nine impermeability or
6 something that is more impervious would require a
7 use of synthetic material in the covering of the
8 site.

9 A couple of other features of the Alternative is
10 that there is one small area next to the location of
11 the pipeline between the plant and the lagoon, which
12 we call P5, that had some soil contamination. We
13 were proposing excavating that area and putting a
14 soil inside the fenced area and then covering it.

15 As you can see, filling of the lagoon.

16 And future deed restrictions.

17 And institutional controls so that the site is not
18 used for residential development or will allow po-
19 tential exposure to humans.

20 Now, the feasibility study, as you saw from the
21 previous slide had a range of costs, both a high and
22 a low cost for each of the alternatives. We made

23 the decision that, just to give the public the basis
24 of comparison, we would choose the midpoint within
25 each range. Because I was concerned that somebody

1 might pick up the document and say, 'Well, the high
2 cost for Alternative 4 was less than the low cost
3 for Alternative' -- so we just wanted to simplify
4 the numbers so that we could compare the costs of
5 the various alternatives.

6 Similarly, when I estimated the costs for the modi-
7 fications to Alternative 3, I utilized two other
8 things to help me determine the midpoint. Those
9 were some recent cost information for other caps
10 that were proposed in South Carolina at other loca-
11 tions. And, number two, a computer software package
12 that estimated the cost of doing different types of
13 remedies. It was not just generic software but a
14 very specific package that has specific costs for
15 numerous locations in South Carolina. In other
16 words, different costs for doing work in Greenville
17 than other places. And the costs have been updated
18 several times during the year, so our cost estimate
19 is probably as good as you can get.

20 Ultimately whenever any of these design costs are
21 decided after they are built, after they are drawn
22 up and after they are -- after plans and specs are
23 let out and they are bid upon and the things are

24 fully finished. It reflects any construction activ-
25 ity, all those costs.

1 So the Agency has proposed modification of Alterna-
2 tive 3 for the cleanup of the Beaunit Knitting &
3 Dyeing Site, which is a monitoring program for the
4 groundwater, the sediments and the surface waters
5 and the capping of the Site.

6 One of the things that I mentioned a few moments ago
7 is how do we decide which one to pick. Obviously
8 the key factor in all of our decision making is the
9 overall protection of human health and the environ-
10 ment.

11 The second thing which is most important is that we
12 have nine criteria. They are all contained in the
13 Proposed Plan. They are located in a block that
14 goes through them all, which is located on page
15 eleven in the left-hand column.

16 The nine criteria are divided into three groupings.
17 The two most important things which are on this are
18 the overall protection of human health and environ-
19 ment and the second thing is called compliance with
20 what we call ARARs, applicable and appropriate
21 requirements.

22 When you are talking about drinking water, the Fed-
23 eral Government and the State Government have numer-
24 ical numbers for various contaminants which they

25 cannot exceed. They are the MCLs. It is easy to

1 see if something does meet those requirements.

2 There are no numeric numbers in any regulation that

3 would tell you how clean the soil would be. One

4 thing is that in typical soil contamination, you

5 have to -- we use two different ideals.

6 One is that some things that we are trying to regu-

7 late have applicable regulations. We have a num-

8 bet -- and some things have what we call "relevant

9 and appropriate" of a State law. There are some

10 things that you can see if it is cleaned up, to a

11 certain point that it would reduce the risk level to

12 an acceptable level. That is the appropriate and

13 relevant requirement.

14 The second criteria that we have to use to select

15 alternatives is compliance with ARARs, as we call

16 them.

17 There is another five criteria and, as you can see,

18 they are all written there (page eleven of Proposed

19 Plan).

20 The effects long-term? Is it permanent?

21 Does it reduce the toxicity, mobility or volume

22 through treatment?

23 Does it have a short-term effectiveness?

24 And whether it meets State acceptance.

25 And what is the risk to the individuals doing the

1 remedy? You don't want to harm the people who are
2 out in the field at the Site working.
3 And is it implementable?
4 And what does it cost?
5 Is it innovative?
6 Does it have a proven track record?
7 Last, and certainly not least, does a modified cri-
8 teria have State acceptance and community accep-
9 tance?
10 All of these factors come into our decision making
11 process when choosing an alternative.
12 The question that remains now is where do we go from
13 there, or what happens next?
14 At Region IV, we like to issue a Proposed Plan of
15 Action for the public, so that the public can under-
16 stand. And we did that several weeks ago. We gen-
17 erally try to have a public meeting after people
18 have had an opportunity to look at the document for
19 a period of time. Such a meeting as we are at to-
20 night.
21 We have a comment period on this which will run
22 until December 7th.
23 It is also a practice of Region IV that if anyone
24 wants a longer period of time that we will automati-
25 cally grant an extension to the comment period.

1 You might ask what happens to your comments? Do
2 they go into a file? All comments and any questions
3 that you might ask -- that's why we have a stenogra-
4 pher here -- have to be responded to, in writing.
5 They are responded to and then attached to the docu-
6 ment that EPA will produce. Everyone's comments
7 have an equal value. We have some PRP's in the
8 audience tonight and they tend to comment quite a
9 bit on what we propose. So -- and obviously they
10 have a financial interest in it. We take their
11 comments, we take your comments and attach them to
12 the record of decision. We attach your questions
13 and comments, and we attach our respond. That an
14 attachment to the decision.
15 EPA proposes something, we take comments on it and
16 now 'this is what we think should happen.' Quite
17 often there may be further modification on the Pro-
18 posed Plan after public input.
19 The record of decision will be probably a sixty to a
20 hundred and ten page document wherein we will go
21 through this entire process in greater detail, a
22 summarization of all alternatives. More detailed
23 information on the risk assessment, the selection of
24 an alternative and the responsiveness summary. That
25 will also include a transcript of tonight's meeting.

1 Then there will a recommendation with the Agency
2 publicly saying 'this is how we feel that the Site
3 should be cleaned up.' And if anybody is going to
4 clean up the Site -- well, let me correct that.
5 Not "if" but when the Site is cleaned up, that's how
6 it is going to be done. So the question becomes,
7 'Well, who is going to do it?' Hopefully we will
8 get an agreement with the PRP's for cleaning up the
9 Site and they will negotiate with EPA and sign a
10 Consent Agreement, which is the contractual obliga-
11 tion to remediate the Site. We used a different --
12 the Administration Order Under Consent, which I
13 talked about earlier. We use a Consent Agreement,
14 which is a very lengthy document which is entered
15 into by the parties, given to a Judge and the Judge
16 asks for comments and then it becomes final. If
17 somebody doesn't live up to it -- everyone knows how
18 lengthy legal processes can be. You don't have to
19 go through all that with a Consent Order or Consent
20 Agreement. There are penalties in there, onerous
21 penalties, sometimes very severe penalties of sever-
22 al thousand dollars a day for not doing things that
23 were agreed to be done.
24 So the Consent Agreement is the agreement where the
25 PRP's indicate to perform a remedy.

1 There will be a design hearing with a design speci-

2 fication of the cap to meet the performance stan-
3 dards of the ten to the minus nine permeability.
4 They will -- or EPA, if we cannot reach agreement
5 with the PRP's, we will use Superfund money to pur-
6 sue the remedy and seek costs from the PRP's for the
7 remedy.

8 Then once the remediation is successful, at some
9 point in the future the Site can be delisted.

10 with that, I will ask if there are any questions?

11 (No response from attendees)

12 BY MR. SANDLER:

13 No questions?

14 (No response from attendees)

15 BY MR. SANDLER:

16 Well, you may be thinking of something -- (pause).

17 I invite you'all to look at these photographs (indi-
18 cating photographs put on public table). Some of
19 you probably don't know what the Site looks like,
20 unless you've been trespassing.

21 No questions?

22 (No response from attendees)

23 BY MR. SANDLER:

24 Well, if you think of anything our 800-Number is on
25 the Proposed plan, and our address. If you're not

301

1 on our mailing list, there is a mailing list coupon
2 on the back page, the last page. We will continue

to give you information on the Site as the process continues.

I want to thank everyone for coming tonight.

If you have any questions, we will certainly be here
for a period to talk with you.

Thank you.

Hearing no questions, we are adjourned.

(CONCLUDED)

State of South Carolina)
County of Greenville)

